

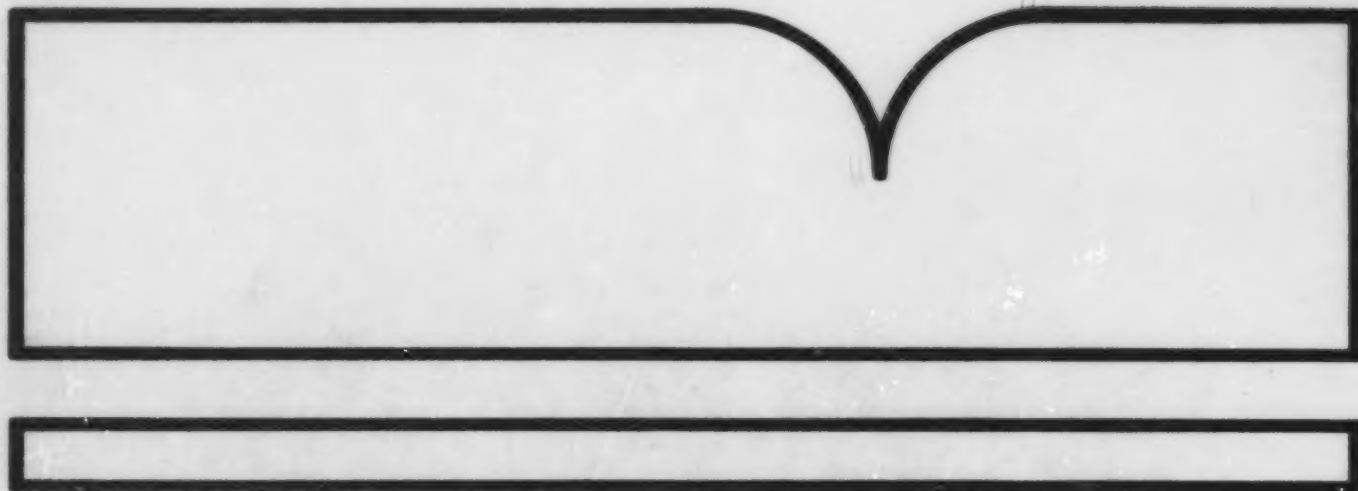
Effect of Ambient Temperature and  
Driving Cycle on Exhaust Emissions

(U.S.) Department of Energy  
Bartlesville, OK

Prepared for

Environmental Protection Agency  
Ann Arbor, MI

Jun 80



U.S. Department of Commerce  
National Technical Information Service

**NTIS.**

**TECHNICAL REPORT DATA**  
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|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |  |                                                  |                                                       |                        |
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| 1. REPORT NO.<br>EPA-460/3-80-012                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |  | 2.                                               | 3. RECIPIENT'S ACCESSION NO.<br>PB01 155517           |                        |
| 4. TITLE AND SUBTITLE<br>EFFECT OF AMBIENT TEMPERATURE AND DRIVING CYCLE ON EXHAUST EMISSIONS                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |  |                                                  | 5. REPORT DATE<br>June 1980                           |                        |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |  |                                                  | 6. PERFORMING ORGANIZATION CODE                       |                        |
| 7. AUTHOR(S)<br>W. F. Marshall                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |  |                                                  | 8. PERFORMING ORGANIZATION REPORT NO.                 |                        |
| 9. PERFORMING ORGANIZATION NAME AND ADDRESS<br>U. S. Department of Energy<br>Bartlesville Energy Technology Center<br>P.O. Box 1398<br>Bartlesville, OK 74003                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |  |                                                  | 10. PROGRAM ELEMENT NO.                               |                        |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |  |                                                  | 11. CONTRACT/GRANT NO.<br><br>EPA-IAG 79-DX0678       |                        |
| 12. SPONSORING AGENCY NAME AND ADDRESS<br>Environmental Protection Agency<br>Office of Mobile Source Air Pollution Control<br>Emission Control Technology Division<br>Test and Evaluation Branch, Ann Arbor, MI 48105                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |  |                                                  | 13. TYPE OF REPORT AND PERIOD COVERED<br>Final Report |                        |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |  |                                                  | 14. SPONSORING AGENCY CODE                            |                        |
| 15. SUPPLEMENTARY NOTES                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |  |                                                  |                                                       |                        |
| 16. ABSTRACT<br>Data on exhaust emissions were obtained from two vehicle fleets (1970 and 1979 model-year) operating over a range of ambient temperatures. The work is providing a baseline against which current-production vehicles can be compared, thus enabling a more complete assessment of automotive emissions reduction achievements. The baseline fleet represented the 1970 MY nationwide mix. The 37 cars were tested at 25°, 75°, and 100° F over the urban Federal Test Procedure, Highway Fuel Economy Test, and New York City Cycle. Both temperature and driving cycle were found to have significant effects on exhaust emissions. The conditions which yielded the greatest adverse effects on emissions were (1) low temperature--urban driving cycle, and (2) high temperature--New York City driving cycle. The data also indicate that the use of air conditioners causes increased emission levels. These results apply directionally to both fleets. However, the influences of temperature and driving cycle on emission rates of the current model-year fleet were significantly less than on those of the baseline fleet. |  |                                                  |                                                       |                        |
| 17. KEY WORDS AND DOCUMENT ANALYSIS                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |  |                                                  |                                                       |                        |
| a. DESCRIPTORS                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |  | b. IDENTIFIERS/OPEN ENDED TERMS                  |                                                       | c. COSATI Field/Group  |
| Vehicle emissions*, Vehicle fuel economy*, Ambient temperatures*, Air conditioning, Short tests, Federal Test Procedure, Highway Fuel Economy Test, New York City Cycle                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |  |                                                  |                                                       |                        |
| 18. DISTRIBUTION STATEMENT<br>Release to public                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |  | 19. SECURITY CLASS (This Report)<br>Unclassified |                                                       | 21. NO. OF PAGES<br>72 |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |  | 20. SECURITY CLASS (This page)<br>Unclassified   |                                                       | 22. PRICE              |

United States  
Environmental Protection  
Agency

Motor Vehicle Emission Lab  
2565 Plymouth Rd.  
Ann Arbor, Michigan 48106

EPA-460/3-80-012  
June 1980

Air

PRR1-155517



# Effect of Ambient Temperature and Driving Cycle on Exhaust Emissions

REPRODUCED BY  
NATIONAL TECHNICAL  
INFORMATION SERVICE  
U.S. DEPARTMENT OF COMMERCE  
SPRINGFIELD, VA 22161

EPA-460/3-80-012

**EFFECT OF AMBIENT TEMPERATURE AND  
DRIVING CYCLE ON EXHAUST EMISSIONS**

by

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**U.S. Department of Energy  
Bartlesville Energy Technology Center  
Division of Utilization  
Bartlesville, Oklahoma 74003**

**Interagency Agreement No. EPA-IAG 79-DX0678**

**EPA Project Officer: Edward Anthony Barth**

**Prepared for  
U.S. ENVIRONMENTAL PROTECTION AGENCY  
OFFICE OF AIR, NOISE AND RADIATION  
OFFICE OF MOBILE SOURCE AIR POLLUTION CONTROL  
EMISSION CONTROL TECHNOLOGY DIVISION  
TEST AND EVALUATION BRANCH  
ANN ARBOR, MI 48105**

**June 1980**

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This report was furnished to the Environmental Protection Agency by the U.S. Department of Energy's Bartlesville (Okla.) Energy Technology Center in fulfillment of Interagency Agreement No. EPA-IAG 79-DX0678. The contents of this report are reproduced herein as received from the Bartlesville Energy Technology Center, Bartlesville, OK 74003. The opinions, findings, and conclusions expressed are those of the author and not necessarily those of the Environmental Protection Agency. Mention of company or product names is not to be considered as an endorsement by the Environmental Protection Agency.

## FOREWORD

This report presents a summary of work performed by the U.S. Department of Energy's Bartlesville (Okla.) Energy Technology Center for the Environmental Protection Agency, Office of Air, Noise and Radiation, under Interagency Agreement No. EPA-IAG 79-DX0678.

Mr. Edward Anthony Barth was the Project Officer for EPA. The program at Bartlesville was directed by R. W. Hurn (now retired), Director of Utilization, and W. F. Marshall was the Project Leader. Others who contributed to the project were B. H. Eccleston (now deceased), T. R. Owens, J. K. Brooke, E. R. Inman, S. J. Golemon, R. F. Stevens, A. R. Silva, and D. R. Thompson.

## SUMMARY

Data on exhaust emissions were obtained from two vehicle fleets (1970 and 1979 model-year) operating over a range of ambient temperatures. The work is providing a baseline against which current-production vehicles can be compared, thus enabling a more complete assessment of automotive emissions reduction achievements.

The baseline fleet represented the 1970 model-year nationwide mix. The 37 cars were tested at 25°, 75°, and 100° F over the urban Federal Test Procedure, Highway Fuel Economy Test, and New York City Cycle.

Both temperature and driving cycle were found to have significant effects on exhaust emissions. The conditions which yielded the greatest adverse effects on emissions were (1) low temperature--urban driving cycle, and (2) high temperature--New York City driving cycle. The data also indicate that the use of air conditioners causes increased emission levels.

These results apply directionally to both fleets. However, the influences of temperature and driving cycle on emission rates of the current model-year fleet were significantly less than on those of the baseline fleet.

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## LIST OF ABBREVIATIONS AND SYMBOLS

|                 |                                                       |
|-----------------|-------------------------------------------------------|
| A/C             | -- air conditioning                                   |
| CO <sub>2</sub> | -- carbon dioxide                                     |
| CO              | -- carbon monoxide                                    |
| CT              | -- cold transient phase of the FTP                    |
| CVS             | -- constant volume sample                             |
| FIA             | -- fluorescence indicating absorption                 |
| FID             | -- flame ionization detector                          |
| FTP             | -- Federal Test Procedure                             |
| GLC             | -- gas liquid chromatography                          |
| gpm             | -- grams per mile                                     |
| HC              | -- hydrocarbon                                        |
| HFET            | -- Highway Fuel Economy Test                          |
| HT              | -- hot transient phase of the FTP                     |
| IBP             | -- initial boiling point                              |
| MBTH            | -- 3-methyl-2-benzothiazolone hydrozone hydrochloride |
| MY              | -- model year                                         |
| NDIR            | -- nondispersive infrared                             |
| NO <sub>x</sub> | -- nitrogen oxides                                    |
| NYCC            | -- New York City Cycle                                |
| scfm            | -- standard cubic feet per minute                     |
| ST              | -- stabilized phase of the FTP                        |

EPA Baseline Testing  
FINAL REPORT

Report of experimental work done in cooperation with EPA:  
Interagency Agreement No. EPA-IAG 79-DX0678

### PURPOSE

The purpose of this interagency agreement between the Environmental Protection Agency (EPA) and the Department of Energy (DOE) was to determine a baseline for automobile emissions at a variety of ambient temperatures, and to evaluate the emission trends of new technology vehicles relative to that baseline. This baseline may be used in formulating regulations for reducing emissions at other than "standard FTP" conditions as well as provide information for future testing procedure revisions.

### BACKGROUND

When the Clean Air Act became law, it required that a 90 percent reduction of automobile emissions be accomplished within a specified time frame. The Federal Test Procedure (FTP) for measuring automotive emissions is accomplished under limited ambient temperature conditions, namely between 68° and 86° F. Data exists which shows that automobile emissions increase with reductions in ambient temperature and may also increase at higher temperatures. Because of the need to reduce vehicle emissions under all ambient conditions, the EPA needs data to aid in establishing baseline vehicle emissions levels under conditions which encompass most national ambient conditions. With such a baseline the effects of a 90 percent reduction of emissions at different temperatures can be calculated, corresponding emission standards or guidelines determined, and the impact of such regulations evaluated.

### OBJECTIVE

The objective of this interagency agreement was to determine the effect of ambient temperature on the exhaust emissions of automobiles equipped with 1970 engines and control systems, to establish a baseline from the data for 1970 vehicles, and to determine how a few late model vehicles perform with regard to this baseline. In order to achieve these objectives, the tasks specified in the scope of work were performed.

### Vehicle Selection

The baseline fleet was acquired from two sources: twenty-five 1970 model-year vehicles had been previously acquired and tested by Automotive Testing Laboratories, Inc., under contract with Motor Vehicle Manufacturers Association (MVMA). The vehicles were selected to represent the 1970 model-year nation-wide sales mix (1).<sup>\*</sup> After receiving the vehicles, idle speed and timing checks were made as necessary. It should be noted that dynamometer power settings and inertia weights in this work were not identical to those used by Automotive Testing Laboratories and, therefore, there could be differences in tests results. The reason for the differences in settings

---

<sup>\*</sup>Numbers in parentheses designate references at the end of the report.

was that the 1970 procedure was used by the MVMA, and the 1975 procedure was used in the present work. Results obtained with this 25-car fleet were published previously (2).

The EPA supplied the five other vehicles of the baseline fleet. The current production vehicles were purchased as new cars by DOE from various automobile dealers.

| <u>Test Fleet</u>                | <u>No. of Vehicles</u> |
|----------------------------------|------------------------|
| Baseline vehicles (1970 MY)..... | 30                     |
| Production late model:           |                        |
| three-way catalyst vehicles..... | 3                      |
| stratified charge.....           | 1                      |
| diesel.....                      | 2                      |
| turbocharged.....                | <u>1</u>               |
| Total cars                       | 37                     |

A more complete description of the test fleet is given in table 1. A description of maintenance and repairs for each of the 1970 MY baseline vehicles is given in table 2.

#### Test Sequence and Analyses

All cars were tested according to the 1975 FTP, 1975 Federal HFET, the NYCC, and the idle and 2500 rpm test. A description of these driving cycles is given in table 3. Deviations from the 1975 FTP and HFET were:

- a. No evaporative emissions test.
- b. The vehicle hoods were closed; cooling air velocity keyed to vehicle speed.
- c. The 10 percent load increment for vehicles equipped with air conditioning was not used in any tests.
- d. Actual vehicle mileage was used in all emissions and economy computations.

Emissions measured for the four tests noted above were HC, CO, NO<sub>x</sub>, and CO<sub>2</sub>. In addition to these, aldehydes and HC distribution (by gas chromatography) were determined for the current-production vehicles for each of the three phases of the 1975 FTP.

Tests were conducted at ambient temperatures of 25°, 50°, 75°, and 100° F with duplicates of the 25° and 100° F test points. In addition, tests were conducted at 75° and 100° F with air conditioning operating for those vehicles with functioning air-conditioning systems.

### Test Fuels

Four fuels were used in this work. Fuel A was used in all tests of spark-ignition powered vehicles conducted at 50° F and above. Two winter-grade fuels were used in this work. Fuel B was used in 25° F tests for 25 of the cars with baseline fleet and for four of the late model cars. The quantity of fuel B was insufficient to conduct all at the 25° F tests, and the original supplier was not able to furnish any additional fuel within the period of this work. Therefore, another winter-grade fuel was used to complete the low temperature tests. This fuel, fuel C, was used in 25° F tests for five of the cars in the baseline fleet and one of the late model cars. All three gasolines were produced by Phillips Petroleum Company with target specifications based on those given in the Federal Register.

A single lot of diesel fuel meeting 2-D specifications was used for both diesel vehicles at all test temperatures. Fuel inspection data are given in table 4.

### Test Facilities

A schematic diagram of the chassis dynamometer facility is shown in figure 1. Details of the facility and analytical systems are given below:

#### Chassis dynamometer (Clayton Model ECE-50):

- o dual roll, 8.65 in. diameter, 17.25 in. spacing
- o direct drive flywheel system - 1750-9625-lb compatibility in 125-lb increments
- o road load power control to provide good tracking of speed power relationship

#### Ambient conditions:

- o closed system with make-up air
- o temperature controlled within range of 20° to 120° F
- o humidity control, with target of 50 percent relative humidity
- o cooling air supplied to front of vehicle; air velocity modulated to follow dynamometer roll speed

#### CVS system:

- o critical flow orifice system (with heat exchanger), 320 scfm (nominal)
- o air supply independent of chassis dynamometer room air
- o dilution air temperature controlled within range of 60° to 110° F
- o length of connection from tailpipe to CVS system = 10 ft

#### Analytical instruments:

##### For CVS samples -

Beckman 864 NDIR - CO<sub>2</sub>  
Beckman 865 NDIR - CO

Beckman 851H chemiluminescence detector - NOx  
Beckman 400 FID - HC  
Beckman 402 heated FID - HC

For raw exhaust measurement -

Beckman 315A NDIR - CO  
Beckman 851H CL - NOx  
Beckman FID - HC

Other: EG&G 880 dew point hygrometer

Analytical procedures:

- o aldehydes - MBTH method, sampling via bubblers
- o hydrocarbons - GLC; sample from bags (corresponding to test phases) directly into GLC sample loop

RESULTS

A summary of the FTP results is given in table 5. Detailed information is given in the appendices. A summary of the results of individual FTP emissions, FTP fuel economy, and HFET fuel economy is given in appendix A. Results with respect to the HC, CO, and NOx emissions are given in appendices B, C, and D, respectively. Fuel economy data are in appendix E. Aldehyde emissions (for the seven current-production vehicles only) are in appendix F.

Comparison of average emissions and fuel economy for the three fleets (baseline, current gasoline, and current diesel) is shown in tables 6-9. Referenced to the 75° F, FTP case, the results appear to show that temperature extremes had a greater deleterious effect on emissions performance of the current production fleet. However, if the results are referenced to the emissions "standards" applicable to each fleet, the current-production fleet's performance appears to be markedly better than that of the baseline fleet.

Absolute and percentage differences in emission rates between the baseline and the two current fleets are given in table 10. The current gasoline fleet's emission levels were about 70 percent less than the baseline fleet. Emissions of CO and HC from the two diesel vehicles were about 90 percent less than those from the baseline fleet, and NOx emissions were about 60 percent less.

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TABLE 1. - Vehicle description

| Vehicle No. | Make/Model            | Eng. CID-config. | Carb. | Trans. | Air cond. | Test condition     |               |
|-------------|-----------------------|------------------|-------|--------|-----------|--------------------|---------------|
|             |                       |                  |       |        |           | Inertia weight, lb | Power absorb. |
| 1           | Ford Wagon            | 351-V8           | 2 bb1 | Auto   | Yes       | 4000               | 12.0          |
| 2           | Pontiac LeMans        | 350-V8           | 2 bb1 | Auto   | Yes       | 4000               | 12.0          |
| 3           | Chevrolet Malibu      | 307-V8           | 2 bb1 | Auto   | Yes       | 3500               | 11.2          |
| 4           | Mercury Marquis       | 429-V8           | 2 bb1 | Auto   | Yes       | 5000               | 13.4          |
| 5           | Dodge Charger         | 318-V8           | 2 bb1 | Auto   | Yes       | 4500               | 12.7          |
| 6           | Olds. Delta 88        | 455-V8           | 2 bb1 | Auto   | Yes       | 4500               | 12.7          |
| 7           | Plymouth Duster       | 318-V8           | 2 bb1 | Auto   | No        | 3500               | 11.2          |
| 8           | Chevrolet Impala      | 400-V8           | 2 bb1 | Auto   | Yes       | 4000               | 12.0          |
| 9           | Buick LeSabre         | 350-V8           | 2 bb1 | Auto   | Yes       | 4500               | 12.7          |
| 10          | Ford Galaxie          | 351-V8           | 2 bb1 | Auto   | No        | 4000               | 12.0          |
| 11          | Chevrolet Nova        | 230-L6           | 1 bb1 | Auto   | No        | 3500               | 11.2          |
| 12          | Pontiac Catalina      | 350-V8           | 2 bb1 | Auto   | Yes       | 4500               | 12.7          |
| 13          | Buick Skylark         | 350-V8           | 2 bb1 | Auto   | Yes       | 4000               | 12.0          |
| 14          | Dodge Challenger      | 225-L6           | 1 bb1 | Man. 3 | No        | 3500               | 11.2          |
| 15          | Ford Maverick         | 200-L6           | 1 bb1 | Auto   | Yes       | 3000               | 10.3          |
| 16          | Chevrolet Monte Carlo | 350-V8           | 2 bb1 | Auto   | Yes       | 4000               | 12.0          |
| 17          | Ford Fairlane         | 302-V8           | 2 bb1 | Auto   | No        | 4000               | 12.0          |
| 18          | Chevrolet El Camino   | 350-V8           | 2 bb1 | Man. 3 | No        | 4000               | 12.0          |
| 19          | Cadillac DeVille      | 472-V8           | 4 bb1 | Auto   | No        | 5500               | 13.9          |
| 20          | Chrysler Newport      | 383-V8           | 2 bb1 | Auto   | Yes       | 5000               | 13.4          |

NOTE: Vehicle No. 1-28 are 1970 MY, No. 29-30 are 1971 MY, No. 1C-2C are 1978 MY, No. 3C-6C are 1979 MY, and No. 7C is 1980 MY.

TABLE 1. - Vehicle description--Continued

| Vehicle No. | Make/Model                          | Eng. CID-config. | Carb. | Trans. | Air cond. | Test condition     |               |
|-------------|-------------------------------------|------------------|-------|--------|-----------|--------------------|---------------|
|             |                                     |                  |       |        |           | Inertia weight, lb | Power absorb. |
| 21          | Ford Maverick                       | 170-L6           | 1 bbl | Man. 3 | No        | 3000               | 10.3          |
| 22          | AMC Hornet                          | 232-L6           | 1 bbl | Man. 3 | No        | 3000               | 10.3          |
| 23          | Olds. Vista Cruiser                 | 350-V8           | 2 bbl | Auto   | Yes       | 5000               | 13.4          |
| 24          | Volkswagen Beetle                   | 1.6L-H4          | 1 bbl | Man. 4 | No        | 2500               | 9.4           |
| 25          | Chevrolet Nova                      | 250-L6           | 1 bbl | Auto   | No        | 3500               | 11.2          |
| 26          | Chevrolet Impala                    | 350-V8           | 2 bbl | Auto   | Yes       | 4500               | 12.7          |
| 27          | Ford Galaxie                        | 351-V8           | 2 bbl | Auto   | Yes       | 4500               | 12.7          |
| 28          | Plymouth Valiant                    | 225-L6           | 1 bbl | Auto   | No        | 3500               | 11.2          |
| 29          | Chevrolet Vega Wagon                | 140-L4           | 2 bbl | Man. 3 | No        | 3000               | 10.3          |
| 30          | Ford Wagon                          | 429-V8           | 4 bbl | Auto   | Yes       | 5500               | 13.9          |
| 1C          | Buick Skylark<br>(3-way catalyst)   | 231-V6           | 2 bbl | Auto   | Yes       | 3500               | 11.2          |
| 2C          | Pontiac Sunbird<br>(3-way catalyst) | 151-L4           | 2 bbl | Auto   | Yes       | 3500               | 11.2          |
| 3C          | Ford Mustang<br>(turbocharged)      | 140-L4           | 2 bbl | Man. 4 | Yes       | 3000               | 10.2          |
| 4C          | Dodge Challenger<br>(MCA-jet)       | 1.6L-L4          | 2 bbl | Man. 5 | Yes       | 3000               | 10.3          |
| 5C          | Olds. Cutlass Diesel<br>(diesel)    | 260-V8           | F.I.  | Auto   | Yes       | 4000               | 12.0          |
| 6C          | BMW 528i<br>(3-way catalyst)        | 2.8L-L6          | F.I.  | Man. 4 | Yes       | 3500               | 11.2          |
| 7C          | Volkswagen Rabbit<br>(diesel)       | 1.5L-L4          | F.I.  | Man. 4 | Yes       | 2250               | 8.8           |

TABLE 2. - Maintenance required for baseline fleet

| Vehicle No. | Maintenance required                                                                                                 |
|-------------|----------------------------------------------------------------------------------------------------------------------|
| 1           | Charge A/C system                                                                                                    |
| 2           | Repair vacuum leak in A/C controls<br>Charge A/C system                                                              |
| 3           | Replace A/C blower                                                                                                   |
| 4           | Replace A/C blower<br>Replace alternator<br>Repair transmission leak<br>Replace exhaust system<br>Replace rear tires |
| 5           | Replace battery cable clamp                                                                                          |
| 6           | Reinstall choke pull-off rod                                                                                         |
| 7           | Replace voltage regulator<br>Repair A/C system                                                                       |
| 8           | Replace battery                                                                                                      |
| 9           | Replace belt                                                                                                         |
| 10          | None                                                                                                                 |
| 11          | None                                                                                                                 |
| 12          | Replace exhaust system<br>Replace rear tires                                                                         |
| 13          | None                                                                                                                 |
| 14          | Replace clamps on exhaust pipe                                                                                       |
| 15          | Repair fuel leak at carburetor<br>Replace idle stop solenoid<br>Replace exhaust pipe                                 |
| 16          | Repair field relay<br>Charge A/C system                                                                              |
| 17          | Replace A/C drive belt<br>Replace exhaust system<br>Replace rear tires                                               |

TABLE 2. - Maintenance required for baseline fleet--Continued

| Vehicle<br>No. | Maintenance required                                        |
|----------------|-------------------------------------------------------------|
| 18             | Replace exhaust pipe clamp<br>Repair choke linkage          |
| 19             | Replace voltage regulator<br>Repair heater and A/C controls |
| 20             | Charge A/C system                                           |
| 21             | None                                                        |
| 22             | Replace vacuum switching valve                              |
| 23             | Charge A/C system                                           |
| 24             | None                                                        |
| 25             | Charge A/C system                                           |
| 26             | None                                                        |
| 27             | None                                                        |
| 28             | Replace muffler                                             |
| 29             | None                                                        |
| 30             | None                                                        |

TABLE 3. - Description of driving cycles

| Cycle                     | FTP  | HFET  | NYCC |
|---------------------------|------|-------|------|
| Length, miles.....        | 7.45 | 10.24 | 1.18 |
| Average speed, mph.....   | 19.7 | 48.2  | 7.1  |
| Maximum speed, mph.....   | 56.7 | 59.9  | 27.7 |
| Stops per mile.....       | 2.42 | 0.10  | 9.33 |
| Idle, pct of total time.. | 19.5 | 0.5   | 42.1 |
| Cycle time, minutes.....  | 22.9 | 12.8  | 10.0 |

TABLE 4. - Fuel inspection data

| Fuel.....             | A               | B               | C               | D                   |
|-----------------------|-----------------|-----------------|-----------------|---------------------|
|                       | Summer gasoline | Winter gasoline | Winter gasoline | No. 2-D diesel fuel |
| Gravity, °API.....    | 56.9            | 62.6            | 63.4            | 34.5                |
| Cetane index.....     | -               | -               | -               | 45                  |
| Distillation:         |                 |                 |                 |                     |
| IBP.....              | 96              | 86              | 85              | 364                 |
| 10 pct point.....     | 133             | 120             | 113             | 417                 |
| 50 pct point.....     | 219             | 212             | 202             | 493                 |
| 90 pct point.....     | 304             | 300             | 336             | 582                 |
| End point.....        | 406             | 394             | 415             | 616                 |
| Sulfur, wt-pct.....   | 0.029           | 0.022           | 0.046           | 0.23                |
| RVP, lb.....          | 8.4             | 11.8            | 13              | -                   |
| Composition, FIA pct: |                 |                 |                 |                     |
| Saturates.....        | 62              | 70              | 68              | 66                  |
| Olefins.....          | 7               | 6               | 12              | 2                   |
| Aromatics.....        | 31              | 24              | 20              | 32                  |

TABLE 5. - Summary of FTP results

| Temp.<br>°F              | Air<br>cond. | Emissions, gpm |      |                 | Fuel economy, |
|--------------------------|--------------|----------------|------|-----------------|---------------|
|                          |              | HC             | CO   | NO <sub>x</sub> | mpg           |
| BASELINE FLEET           |              |                |      |                 |               |
| 25                       | no           | 4.30           | 40.8 | 4.19            | 12.7          |
| 50                       | no           | 3.54           | 30.6 | 4.26            | 14.0          |
| 75                       | no           | 3.08           | 22.5 | 4.47            | 14.8          |
| 100                      | no           | 3.00           | 18.9 | 4.68            | 15.3          |
| 75                       | yes          | 3.09           | 25.6 | 5.61            | 12.2          |
| 100                      | yes          | 3.17           | 24.2 | 6.53            | 12.2          |
| CURRENT FLEET - GASOLINE |              |                |      |                 |               |
| 25                       | no           | 2.12           | 23.1 | 1.60            | 15.6          |
| 50                       | no           | 1.14           | 14.4 | 1.39            | 17.2          |
| 75                       | no           | 0.67           | 6.6  | 1.35            | 18.1          |
| 100                      | no           | .62            | 6.6  | 1.20            | 19.0          |
| 75                       | yes          | .62            | 6.9  | 1.65            | 17.0          |
| 100                      | yes          | .73            | 8.8  | 1.48            | 16.8          |
| CURRENT FLEET - DIESEL   |              |                |      |                 |               |
| 25                       | no           | 0.38           | 1.4  | 1.70            | 25.2          |
| 50                       | no           | .29            | 1.3  | 1.71            | 26.9          |
| 75                       | no           | .31            | 1.3  | 1.82            | 27.4          |
| 100                      | no           | .31            | 1.4  | 1.69            | 29.6          |
| 75                       | yes          | .33            | 1.4  | 1.81            | 25.0          |
| 100                      | yes          | .39            | 1.6  | 2.14            | 22.0          |

TABLE 6. - HC emissions

| Temp.<br>°F                                                                    | Air<br>cond. | FTP      |         | HFET     |         | NYCC     |         |
|--------------------------------------------------------------------------------|--------------|----------|---------|----------|---------|----------|---------|
|                                                                                |              | Baseline | Current | Baseline | Current | Baseline | Current |
|                                                                                |              |          |         |          |         |          |         |
|                                                                                |              | Gas      | Diesel  | Gas      | Diesel  | Gas      | Diesel  |
| AVERAGE RATE, GPM                                                              |              |          |         |          |         |          |         |
| 25                                                                             | no           | 4.30     | 0.38    | 1.50     | 0.14    | 5.68     | 1.15    |
| 50                                                                             | no           | 3.54     | .23     | 1.50     | .11     | 5.57     | 1.17    |
| 75                                                                             | no           | 3.08     | .31     | 1.59     | .10     | 6.16     | 0.93    |
| 100                                                                            | no           | 3.00     | .31     | 1.70     | .10     | 6.98     | 2.05    |
| 75                                                                             | yes          | 3.09     | .33     | 1.76     | .09     | 5.85     | 1.13    |
| 100                                                                            | yes          | 3.17     | .39     | 2.01     | .23     | 7.94     | 2.12    |
| 0.69                                                                           |              |          |         |          |         |          |         |
| .67                                                                            |              |          |         |          |         |          |         |
| .84                                                                            |              |          |         |          |         |          |         |
| .82                                                                            |              |          |         |          |         |          |         |
| .66                                                                            |              |          |         |          |         |          |         |
| .88                                                                            |              |          |         |          |         |          |         |
| RATIO OF AVERAGES, REFERENCED TO FTP @ 75° F                                   |              |          |         |          |         |          |         |
| 25                                                                             | no           | 1.40     | 1.23    | 0.49     | 0.15    | 1.85     | 1.72    |
| 50                                                                             | no           | 1.15     | 0.94    | .49      | .16     | 1.81     | 1.75    |
| 75                                                                             | no           | 1.00     | 1.00    | .52      | .15     | 2.00     | 1.39    |
| 100                                                                            | no           | 0.98     | 1.00    | .55      | .15     | 2.27     | 3.06    |
| 75                                                                             | yes          | 1.04     | 1.06    | .59      | .13     | 1.96     | 1.69    |
| 100                                                                            | yes          | 1.06     | 1.26    | .67      | .34     | 2.66     | 3.16    |
| 2.23                                                                           |              |          |         |          |         |          |         |
| 2.16                                                                           |              |          |         |          |         |          |         |
| 2.71                                                                           |              |          |         |          |         |          |         |
| 2.65                                                                           |              |          |         |          |         |          |         |
| 2.13                                                                           |              |          |         |          |         |          |         |
| 2.84                                                                           |              |          |         |          |         |          |         |
| RATIO OF AVERAGES, REFERENCED TO STANDARDS<br>(4.1 GPM - 1970, 1.5 GPM - 1979) |              |          |         |          |         |          |         |
| 25                                                                             | no           | 1.05     | 0.25    | 0.37     | 0.09    | 1.39     | 0.77    |
| 50                                                                             | no           | 0.86     | .19     | .37      | .07     | 1.36     | .78     |
| 75                                                                             | no           | .75      | .21     | .39      | .07     | 1.50     | .62     |
| 100                                                                            | no           | .73      | .21     | .41      | .07     | 1.70     | 1.37    |
| 75                                                                             | yes          | .75      | .22     | .43      | .06     | 1.43     | .75     |
| 100                                                                            | yes          | .77      | .26     | .49      | .15     | 1.94     | 1.41    |
| 0.46                                                                           |              |          |         |          |         |          |         |
| .45                                                                            |              |          |         |          |         |          |         |
| .56                                                                            |              |          |         |          |         |          |         |
| .55                                                                            |              |          |         |          |         |          |         |
| .44                                                                            |              |          |         |          |         |          |         |
| .59                                                                            |              |          |         |          |         |          |         |

TABLE 7. - CO emissions

| Temp.<br>°F                                                                  | Air<br>cond. | FTP      |         |        |          | HFET    |        |          |         | NYCC   |      |      |      |
|------------------------------------------------------------------------------|--------------|----------|---------|--------|----------|---------|--------|----------|---------|--------|------|------|------|
|                                                                              |              | Baseline | Current |        | Baseline | Current |        | Baseline | Current |        |      |      |      |
|                                                                              |              |          | Gas     | Diesel |          | Gas     | Diesel |          | Gas     | Diesel |      |      |      |
| AVERAGE RATE, GPM                                                            |              |          |         |        |          |         |        |          |         |        |      |      |      |
| 25                                                                           | no           | 40.8     | 23.1    | 1.4    | 9.2      | 1.5     | 0.8    | 30.3     | 10.5    | 30.3   | 10.5 | 2.6  | 2.6  |
| 50                                                                           | no           | 30.6     | 14.4    | 1.3    | 9.1      | .8      | .7     | 30.8     | 9.9     | 30.8   | 9.9  | 2.6  | 2.6  |
| 75                                                                           | no           | 22.5     | 6.6     | 1.3    | 10.0     | .6      | .7     | 30.6     | 5.8     | 30.6   | 5.8  | 2.8  | 2.8  |
| 100                                                                          | no           | 18.9     | 6.6     | 1.4    | 12.2     | 1.1     | .8     | 44.6     | 26.4    | 44.6   | 26.4 | 3.0  | 3.0  |
| 75                                                                           | yes          | 25.6     | 6.9     | 1.4    | 13.0     | .7      | .7     | 41.8     | 11.5    | 41.8   | 11.5 | 2.9  | 2.9  |
| 100                                                                          | yes          | 24.2     | 8.8     | 1.6    | 19.1     | 4.9     | .9     | 78.3     | 44.9    | 78.3   | 44.9 | 3.1  | 3.1  |
| RATIO OF AVERAGES, REFERENCED TO FTP @ 75° F                                 |              |          |         |        |          |         |        |          |         |        |      |      |      |
| 25                                                                           | no           | 1.82     | 3.49    | 1.12   | 0.41     | 0.23    | 0.60   | 1.35     | 1.59    | 1.35   | 1.59 | 2.02 | 2.02 |
| 50                                                                           | no           | 1.36     | 2.18    | 1.04   | .41      | .12     | .51    | 1.37     | 1.50    | 1.37   | 1.50 | 2.05 | 2.05 |
| 75                                                                           | no           | 1.00     | 1.00    | 1.00   | .45      | .10     | .53    | 1.36     | 0.89    | 1.36   | 0.89 | 2.16 | 2.16 |
| 100                                                                          | no           | 0.84     | 1.00    | 1.06   | .54      | .17     | .61    | 1.99     | 4.00    | 1.99   | 4.00 | 2.31 | 2.31 |
| 75                                                                           | yes          | 1.09     | 1.05    | 1.09   | .55      | .10     | .55    | 1.78     | 1.73    | 1.78   | 1.73 | 2.26 | 2.26 |
| 100                                                                          | yes          | 1.02     | 1.34    | 1.21   | .81      | .74     | .69    | 3.34     | 6.79    | 3.34   | 6.79 | 2.43 | 2.43 |
| RATIO OF AVERAGES, REFERENCED TO STANDARDS<br>(34 GPM - 1970, 15 GPM - 1979) |              |          |         |        |          |         |        |          |         |        |      |      |      |
| 25                                                                           | no           | 1.20     | 1.54    | 0.10   | 0.27     | 0.10    | 0.05   | 0.89     | 0.70    | 0.89   | 0.70 | 0.17 | 0.17 |
| 50                                                                           | no           | 0.90     | 0.96    | .09    | .27      | .05     | .04    | .91      | .66     | .91    | .66  | .18  | .18  |
| 75                                                                           | no           | .66      | .44     | .09    | .29      | .04     | .05    | .90      | .39     | .90    | .39  | .19  | .19  |
| 100                                                                          | no           | .56      | .44     | .09    | .36      | .07     | .05    | 1.31     | 1.76    | 1.31   | 1.76 | .20  | .20  |
| 75                                                                           | yes          | .75      | .46     | .09    | .38      | .05     | .05    | 1.23     | .76     | 1.23   | .76  | .19  | .19  |
| 100                                                                          | yes          | .71      | .59     | .10    | .56      | .32     | .06    | 2.30     | 2.99    | 2.30   | 2.99 | .21  | .21  |

TABLE 8. - NOx emissions

| Temp.<br>of                                                                 | Air<br>cond. | FTP      |         |        | HFET     |         |        | NYCC     |         |        |
|-----------------------------------------------------------------------------|--------------|----------|---------|--------|----------|---------|--------|----------|---------|--------|
|                                                                             |              | Baseline | Current |        | Baseline | Current |        | Baseline | Current |        |
|                                                                             |              |          | Gas     | Diesel |          | Gas     | Diesel |          | Gas     | Diesel |
| AVERAGE RATE, GPM                                                           |              |          |         |        |          |         |        |          |         |        |
| 25                                                                          | no           | 4.19     | 1.60    | 1.70   | 4.96     | 1.23    | 1.31   | 5.35     | 1.67    | 2.99   |
| 50                                                                          | no           | 4.26     | 1.39    | 1.71   | 5.08     | 1.49    | 1.31   | 5.40     | 1.84    | 2.81   |
| 75                                                                          | no           | 4.47     | 1.35    | 1.82   | 5.22     | 1.33    | 1.35   | 5.62     | 1.99    | 2.57   |
| 100                                                                         | no           | 4.68     | 1.20    | 1.69   | 5.69     | 1.22    | 1.36   | 6.10     | 1.30    | 2.93   |
| 75                                                                          | yes          | 5.61     | 1.65    | 1.81   | 6.50     | 1.46    | 1.34   | 6.82     | 3.10    | 3.32   |
| 100                                                                         | yes          | 6.53     | 1.48    | 2.14   | 7.58     | 1.32    | 1.47   | 8.99     | 1.66    | 3.83   |
| RATIO OF AVERAGES, REFERENCED TO FTP @ 75° F                                |              |          |         |        |          |         |        |          |         |        |
| 25                                                                          | no           | 0.94     | 1.19    | 0.93   | 1.11     | 0.91    | 0.72   | 1.20     | 1.24    | 1.64   |
| 50                                                                          | no           | .95      | 1.03    | .94    | 1.14     | 1.10    | .72    | 1.21     | 1.36    | 1.54   |
| 75                                                                          | no           | 1.00     | 1.00    | 1.00   | 1.17     | .99     | .74    | 1.26     | 1.47    | 1.41   |
| 100                                                                         | no           | 1.05     | .89     | .93    | 1.27     | .90     | .75    | 1.36     | .96     | 1.61   |
| 75                                                                          | yes          | 1.21     | 1.22    | .99    | 1.41     | 1.08    | .74    | 1.48     | 2.30    | 1.82   |
| 100                                                                         | yes          | 1.41     | 1.10    | 1.18   | 1.64     | .98     | .81    | 1.95     | 1.23    | 2.10   |
| RATIO OF AVERAGES, REFERENCED TO STANDARDS<br>(4 GPM* - 1970, 2 GPM - 1979) |              |          |         |        |          |         |        |          |         |        |
| 25                                                                          | no           | 1.05     | 0.80    | 0.85   | 1.24     | 0.62    | 0.66   | 1.34     | 0.84    | 1.44   |
| 50                                                                          | no           | 1.07     | .68     | .86    | 1.27     | .74     | .66    | 1.35     | .92     | 1.40   |
| 75                                                                          | no           | 1.12     | .68     | .91    | 1.31     | .66     | .68    | 1.40     | 1.00    | 1.28   |
| 100                                                                         | no           | 1.17     | .60     | .84    | 1.42     | .61     | .68    | 1.52     | .65     | 1.46   |
| 75                                                                          | yes          | 1.40     | .82     | .90    | 1.62     | .73     | .67    | 1.70     | 1.55    | 1.66   |
| 100                                                                         | yes          | 1.63     | .74     | 1.07   | 1.90     | .66     | .74    | 2.25     | .83     | 1.92   |

\*There was no NOx emission standard for the 1970 model year; the 4 gpm value is an estimate of the average for that model year based on the average for the 1971 model-year fleet (see reference 3).

TABLE 9. - Fuel economy

| Temp.<br>of<br>F                             | Air<br>cond. | FTP      |         | HFET   |          | NYCC    |        |      |      |      |
|----------------------------------------------|--------------|----------|---------|--------|----------|---------|--------|------|------|------|
|                                              |              | Baseline | Current |        | Baseline | Current |        |      |      |      |
|                                              |              |          | Gas     | Diesel |          | Gas     | Diesel |      |      |      |
| AVERAGE, MPG                                 |              |          |         |        |          |         |        |      |      |      |
| 25                                           | no           | 12.7     | 15.6    | 25.2   | 20.7     | 24.7    | 33.8   | 7.2  | 10.1 | 16.1 |
| 50                                           | no           | 14.0     | 17.2    | 26.9   | 21.7     | 25.5    | 35.8   | 7.7  | 10.3 | 17.3 |
| 75                                           | no           | 14.8     | 18.1    | 27.4   | 22.4     | 26.5    | 35.4   | 7.7  | 10.6 | 15.7 |
| 100                                          | no           | 15.3     | 19.0    | 29.6   | 22.7     | 27.3    | 36.1   | 7.8  | 10.2 | 17.5 |
| 75                                           | yes          | 12.2     | 17.0    | 25.0   | 18.4     | 24.9    | 34.2   | 6.5  | 9.6  | 14.5 |
| 100                                          | yes          | 12.2     | 16.8    | 22.0   | 17.8     | 24.6    | 30.3   | 6.1  | 8.8  | 12.9 |
| RATIO OF AVERAGES, REFERENCED TO FTP @ 75° F |              |          |         |        |          |         |        |      |      |      |
| 25                                           | no           | 0.86     | 0.86    | 0.92   | 1.40     | 1.37    | 1.23   | 0.49 | 0.56 | 0.59 |
| 50                                           | no           | .94      | .95     | .98    | 1.47     | 1.41    | 1.31   | .52  | .57  | .63  |
| 75                                           | no           | 1.00     | 1.00    | 1.00   | 1.51     | 1.46    | 1.29   | .52  | .58  | .58  |
| 100                                          | no           | 1.04     | 1.05    | 1.08   | 1.53     | 1.51    | 1.32   | .52  | .57  | .64  |
| 75                                           | yes          | .94      | .94     | .92    | 1.42     | 1.38    | 1.25   | .50  | .53  | .53  |
| 100                                          | yes          | .94      | .93     | .80    | 1.37     | 1.36    | 1.11   | .47  | .48  | .47  |

TABLE 10. - Comparison of emissions from three fleets

| Temp.<br>°F                                      | Air<br>cond. | FTP      |        |          |        | MOX      |        |          |        | MYCC     |        |          |        |
|--------------------------------------------------|--------------|----------|--------|----------|--------|----------|--------|----------|--------|----------|--------|----------|--------|
|                                                  |              | HC       |        | CO       |        | Gasoline |        | Diesel   |        | Gasoline |        | Diesel   |        |
|                                                  |              | Gasoline | Diesel | Gasoline | Diesel | Gasoline | Diesel | Gasoline | Diesel | Gasoline | Diesel | Gasoline | Diesel |
| DIFFERENCE IN MEANS, GPM<br>(BASELINE - CURRENT) |              |          |        |          |        |          |        |          |        |          |        |          |        |
| 25                                               | no           | 2.18     | 3.92   | 17.7     | 39.4   | 2.59     | 2.49   | 4.53     | 4.99   | 19.8     | 2.77   | 3.68     | 2.36   |
| 50                                               | no           | 2.40     | 3.25   | 16.2     | 29.3   | 2.87     | 2.55   | 4.40     | 4.90   | 20.9     | 28.2   | 3.56     | 2.59   |
| 75                                               | no           | 2.45     | 2.77   | 15.9     | 21.2   | 3.12     | 2.65   | 5.23     | 5.32   | 24.8     | 27.8   | 3.63     | 3.05   |
| 100                                              | no           | 2.38     | 2.69   | 12.3     | 17.5   | 3.48     | 2.99   | 4.93     | 6.16   | 18.2     | 41.6   | 4.80     | 3.17   |
| 75                                               | yes          | 2.47     | 2.76   | 18.7     | 24.2   | 3.96     | 3.80   | 4.72     | 5.19   | 30.3     | 38.9   | 3.72     | 3.50   |
| 100                                              | yes          | 2.44     | 2.78   | 15.4     | 22.6   | 5.05     | 4.39   | 5.82     | 7.06   | 33.4     | 75.2   | 7.33     | 5.16   |
| Avg                                              |              | 2.39     | 3.03   | 16.0     | 25.7   | 3.51     | 3.19   | 4.94     | 5.60   | 24.6     | 39.9   | 4.45     | 3.31   |
| PERCENT DIFFERENCE                               |              |          |        |          |        |          |        |          |        |          |        |          |        |
| 25                                               | no           | 51       | 91     | 43       | 97     | 62       | 59     | 80       | 88     | 65       | 91     | 69       | 44     |
| 50                                               | no           | 68       | 92     | 53       | 96     | 67       | 60     | 79       | 88     | 68       | 92     | 66       | 48     |
| 75                                               | no           | 78       | 90     | 71       | 94     | 70       | 59     | 85       | 86     | 81       | 91     | 65       | 54     |
| 100                                              | no           | 79       | 90     | 65       | 93     | 74       | 64     | 71       | 88     | 41       | 93     | 79       | 52     |
| 75                                               | yes          | 80       | 89     | 73       | 95     | 71       | 68     | 81       | 89     | 72       | 93     | 55       | 51     |
| 100                                              | yes          | 77       | 88     | 64       | 93     | 77       | 67     | 73       | 89     | 43       | 96     | 82       | 57     |
| Avg                                              |              | 72       | 90     | 62       | 95     | 70       | 63     | 78       | 88     | 62       | 93     | 69       | 51     |

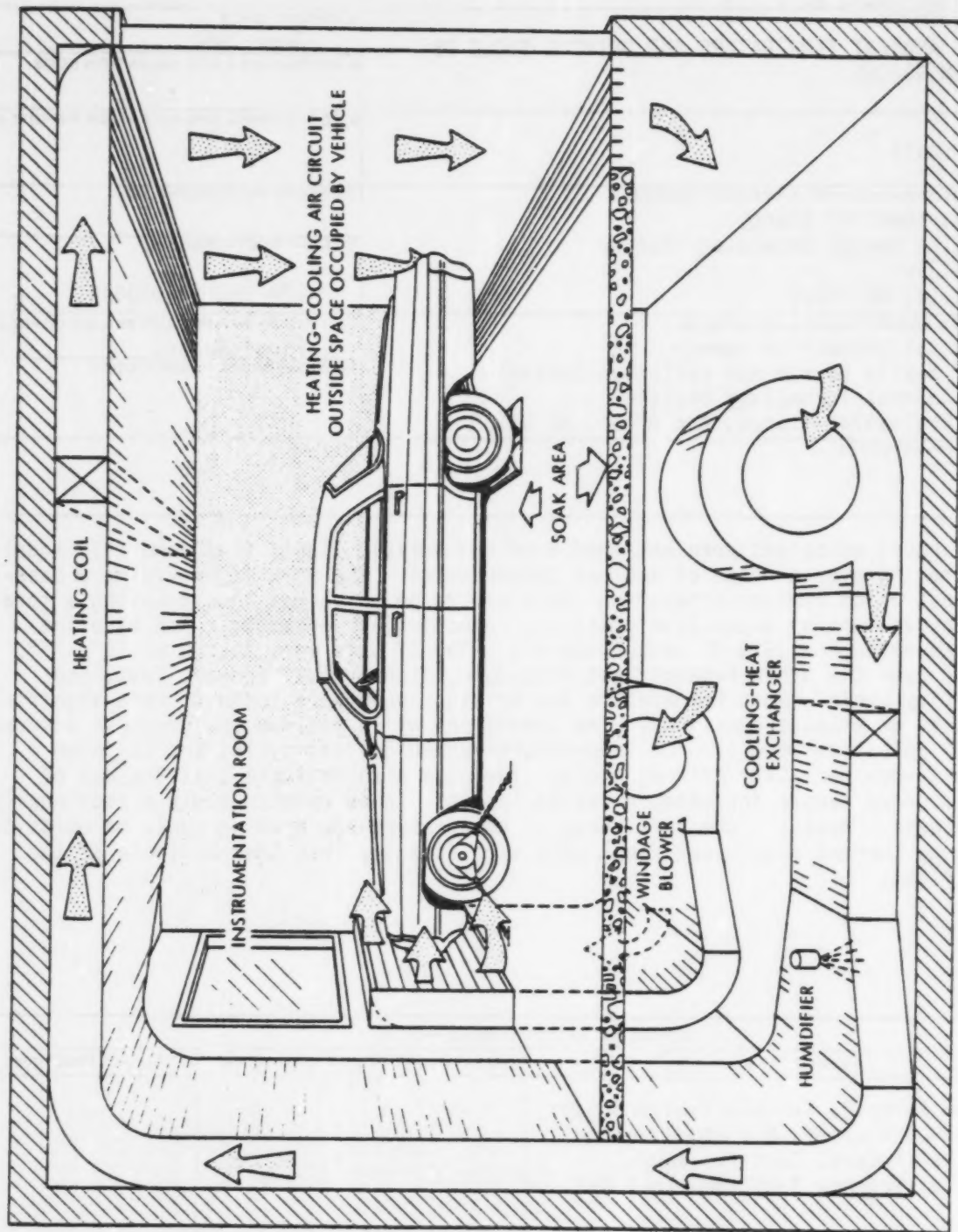


FIGURE 1.- Controlled ambient chassis dynamometer test facility.

**TECHNICAL REPORT DATA**  
(Please read instructions on the reverse before completing)

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |  |                                                       |                       |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|-------------------------------------------------------|-----------------------|
| 1. REPORT NO.<br>EPA-460/3-80-012A, B, C                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |  | 3. RECIPIENT'S ACCESSION NO.                          |                       |
| 4. TITLE AND SUBTITLE<br>EFFECT OF AMBIENT TEMPERATURE AND DRIVING CYCLE ON EXHAUST EMISSIONS                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |  | 5. REPORT DATE<br>June 1980                           |                       |
| 7. AUTHOR(S)<br>W. F. Marshall                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |  | 6. PERFORMING ORGANIZATION CODE                       |                       |
| 9. PERFORMING ORGANIZATION NAME AND ADDRESS<br>U. S. Department of Energy<br>Bartlesville Energy Technology Center<br>P.O. Box 1398<br>Bartlesville, OK 74003                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |  | 8. PERFORMING ORGANIZATION REPORT NO.                 |                       |
| 12. SPONSORING AGENCY NAME AND ADDRESS<br>Environmental Protection Agency<br>Office of Mobile Source Air Pollution Control<br>Emission Control Technology Division<br>Test and Evaluation Branch, Ann Arbor, MI 48105                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |  | 10. PROGRAM ELEMENT NO.                               |                       |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |  | 11. CONTRACT/GRANT NO.<br>EPA-1AG 79-DX0678           |                       |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |  | 13. TYPE OF REPORT AND PERIOD COVERED<br>Final Report |                       |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |  | 14. SPONSORING AGENCY CODE                            |                       |
| 15. SUPPLEMENTARY NOTES                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |  |                                                       |                       |
| 16. ABSTRACT<br>Data on exhaust emissions were obtained from two vehicle fleets (1970 and 1979 model-year) operating over a range of ambient temperatures. The work is providing a baseline against which current-production vehicles can be compared, thus enabling a more complete assessment of automotive emissions reduction achievements. The baseline fleet represented the 1970 MY nationwide mix. The 37 cars were tested at 25°, 75°, and 100° F over the urban Federal Test Procedure, Highway Fuel Economy Test, and New York City Cycle. Both temperature and driving cycle were found to have significant effects on exhaust emissions. The conditions which yielded the greatest adverse effects on emissions were (1) low temperature--urban driving cycle, and (2) high temperature--New York City driving cycle. The data also indicate that the use of air conditioners causes increased emission levels. These results apply directionally to both fleets. However, the influences of temperature and driving cycle on emission rates of the current model-year fleet were significantly less than on those of the baseline fleet. |  |                                                       |                       |
| 17. KEY WORDS AND DOCUMENT ANALYSIS                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |  |                                                       |                       |
| a. DESCRIPTORS                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |  | b. IDENTIFIERS/OPEN ENDED TERMS                       | c. COSATI Field/Group |
| Vehicle emissions*, Vehicle fuel economy*, Ambient temperatures*, Air conditioning, Short tests, Federal Test Procedure, Highway Fuel Economy Test, New York City Cycle                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |  |                                                       |                       |
| 18. DISTRIBUTION STATEMENT<br>Release to public                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |  | 19. SECURITY CLASS (This Report)<br>Unclassified      | 21. NO. OF PAGES      |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |  | 20. SECURITY CLASS (This page)<br>Unclassified        | 22. PRICE             |

APPENDIX A. - SUMMARY OF RESULTS

# APPENDIX A

TABLE A-1. - Summary of results - baseline vehicles (1970 MY)

| Car No. | Vehicle description                            | Temp., ° F | Air cond. | FTP emissions, gpm |      | Fuel econ, mpg |      |
|---------|------------------------------------------------|------------|-----------|--------------------|------|----------------|------|
|         |                                                |            |           | HC                 | CO   | FTP            | HFET |
| 1       | Ford Wagon<br>351-CID<br>Auto<br>4000 lb       | 25         |           | 4.32               | 42.3 | 10.4           | 17.8 |
|         |                                                | 50         |           | 3.52               | 27.8 | 11.4           | 18.8 |
|         |                                                | 75         |           | 2.89               | 15.8 | 12.0           | 19.0 |
|         |                                                | 100        |           | 2.46               | 10.1 | 12.2           | 19.2 |
|         |                                                | 75         | yes       | 3.01               | 17.2 | 11.3           | 17.8 |
| 2       | Pontiac Lemans<br>350-CID<br>Auto<br>4000 lb   | 100        | yes       | 3.07               | 14.3 | 11.5           | 17.6 |
|         |                                                | 25         |           | 4.39               | 46.9 | 11.6           | 19.9 |
|         |                                                | 50         |           | 3.42               | 35.7 | 12.4           | 21.2 |
|         |                                                | 75         |           | 2.66               | 11.9 | 13.9           | 21.4 |
|         |                                                | 100        |           | 2.74               | 10.8 | 14.0           | 20.7 |
| 3       | Chevrolet Malibu<br>307-CID<br>Auto<br>3500 lb | 75         | yes       | 3.13               | 21.6 | 12.4           | 18.8 |
|         |                                                | 100        | yes       | 2.96               | 11.4 | 12.6           | 18.1 |
|         |                                                | 25         |           | 4.32               | 34.4 | 12.8           | 20.5 |
|         |                                                | 50         |           | 4.31               | 33.5 | 13.5           | 20.9 |
|         |                                                | 75         |           | 3.74               | 24.0 | 14.1           | 21.3 |
| 4       | Mercury Marquis<br>429-CID<br>Auto<br>5000 lb  | 100        |           | 3.65               | 19.2 | 14.8           | 21.7 |
|         |                                                | 75         | yes       | 3.75               | 26.4 | 12.6           | 18.6 |
|         |                                                | 100        | yes       | 3.51               | 22.1 | 13.1           | 18.8 |
|         |                                                | 25         |           | 5.20               | 44.9 | 10.2           | 17.9 |
|         |                                                | 50         |           | 4.28               | 27.9 | 11.4           | 17.7 |
| 5       | Dodge Charger<br>318-CID<br>Auto<br>4500 lb    | 75         |           | 3.90               | 19.4 | 12.3           | 19.0 |
|         |                                                | 100        |           | 3.97               | 16.6 | 12.4           | 18.5 |
|         |                                                | 75         | yes       | 3.87               | 18.5 | 11.7           | 17.6 |
|         |                                                | 100        | yes       | 3.97               | 19.6 | 11.2           | 16.7 |
|         |                                                | 25         |           | 3.33               | 23.3 | 13.6           | 20.2 |
|         |                                                | 50         |           | 2.73               | 13.5 | 13.9           | 20.9 |
|         |                                                | 75         |           | 2.96               | 17.3 | 14.9           | 21.3 |
|         |                                                | 100        |           | 2.72               | 19.7 | 15.5           | 22.1 |
|         |                                                | 75         | yes       | 2.93               | 18.1 | 14.3           | 20.6 |
|         |                                                | 100        | yes       | 3.88               | 34.0 | 14.3           | 19.6 |

# APPENDIX A

TABLE A-1. - Summary of results - baseline vehicles (1970 MY)--Continued

| Car No. | Vehicle description                            | Temp., ° F | Air cond. | FTP emissions, gpm |      |      | Fuel econ, mpg |      |
|---------|------------------------------------------------|------------|-----------|--------------------|------|------|----------------|------|
|         |                                                |            |           | HC                 | CO   | NOx  | FTP            | HFET |
| 6       | Oldsmobile Delta<br>455-CID<br>Auto<br>4500 lb | 25         |           | 3.36               | 54.1 | 4.02 | 9.5            | 17.0 |
|         |                                                | 50         |           | 2.21               | 15.8 | 4.36 | 11.0           | 18.4 |
|         |                                                | 75         |           | 2.19               | 11.7 | 4.32 | 11.5           | 19.2 |
|         |                                                | 100        |           | 2.35               | 9.4  | 4.65 | 11.8           | 19.7 |
|         |                                                | 75         | yes       | 2.49               | 13.3 | 5.49 | 10.6           | 17.3 |
| 7       | Plymouth Duster<br>318-CID<br>Auto<br>3500 lb  | 100        | yes       | 1.95               | 9.8  | 6.55 | 10.8           | 16.5 |
|         |                                                | 25         |           | 2.62               | 14.3 | 3.88 | 13.8           | 21.7 |
|         |                                                | 50         |           | 2.32               | 11.1 | 4.14 | 13.3           | 21.3 |
|         |                                                | 75         |           | 2.01               | 12.7 | 4.03 | 14.3           | 22.5 |
|         |                                                | 100        |           | 2.12               | 16.5 | 3.74 | 14.9           | 21.7 |
| 8       | Chevrolet Impala<br>400-CID<br>Auto<br>4000 lb | 25         |           | 5.43               | 50.3 | 2.70 | 10.5           | 17.3 |
|         |                                                | 50         |           | 3.66               | 32.7 | 2.61 | 11.9           | 18.5 |
|         |                                                | 75         |           | 2.54               | 22.7 | 2.60 | 12.2           | 17.9 |
|         |                                                | 100        |           | 2.52               | 23.1 | 2.52 | 12.8           | 18.4 |
|         |                                                | 75         | yes       | 2.79               | 27.2 | 3.47 | 11.4           | 16.5 |
| 9       | Buick LeSabre<br>350-CID<br>Auto<br>4500 lb    | 100        | yes       | 2.52               | 23.3 | 3.56 | 11.9           | 16.7 |
|         |                                                | 25         |           | 4.02               | 39.0 | 5.30 | 12.4           | 18.8 |
|         |                                                | 50         |           | 3.53               | 36.5 | 5.45 | 12.6           | 19.9 |
|         |                                                | 75         |           | 3.63               | 29.7 | 5.29 | 13.2           | 20.1 |
|         |                                                | 100        |           | 4.81               | 19.0 | 6.05 | 13.8           | 20.0 |
| 10      | Ford Galaxy<br>351-CID<br>Auto<br>4000 lb      | 75         | yes       | 4.03               | 27.3 | 6.85 | 12.9           | 18.0 |
|         |                                                | 100        | yes       | 4.11               | 21.2 | 8.48 | 12.8           | 19.0 |
|         |                                                | 25         |           | 5.58               | 45.6 | 6.48 | 12.5           | 20.6 |
|         |                                                | 50         |           | 5.14               | 25.0 | 7.30 | 13.9           | 20.9 |
|         |                                                | 75         |           | 4.69               | 11.7 | 7.98 | 14.5           | 22.4 |
|         |                                                | 100        |           | 4.35               | 10.0 | 8.19 | 15.3           | 21.7 |

# APPENDIX A

TABLE A-1. - Summary of results - baseline vehicles (1970 MY)--Continued

| Car No. | Vehicle description                              | Temp., ° F | Air cond. | FTP emissions, gpm |      | Fuel econ, mpg |      |
|---------|--------------------------------------------------|------------|-----------|--------------------|------|----------------|------|
|         |                                                  |            |           | HC                 | CO   | FTP            | HFET |
| 11      | Chevrolet Nova<br>230-CID<br>Auto<br>3500 lb     | 25         |           | 3.82               | 49.4 | 2.68           | 13.0 |
|         |                                                  | 50         |           | 3.71               | 43.3 | 2.92           | 13.0 |
|         |                                                  | 75         |           | 2.58               | 34.8 | 2.36           | 15.2 |
|         |                                                  | 100        |           | 2.44               | 25.8 | 2.68           | 15.6 |
| 12      | Pontiac Catalina<br>350-CID<br>Auto<br>4500 lb   | 25         |           | 4.64               | 43.6 | 6.30           | 10.0 |
|         |                                                  | 50         |           | 3.70               | 22.6 | 5.29           | 12.5 |
|         |                                                  | 75         |           | 3.17               | 11.2 | 5.40           | 13.2 |
|         |                                                  | 100        |           | 3.38               | 11.4 | 6.28           | 13.2 |
|         |                                                  | 75         | yes       | 3.63               | 14.5 | 8.36           | 11.4 |
|         |                                                  | 100        | yes       | 4.00               | 24.1 | 10.23          | 10.9 |
| 13      | Buick Skylark<br>350-CID<br>Auto<br>4000 lb      | 25         |           | 4.24               | 60.9 | 4.40           | 12.5 |
|         |                                                  | 50         |           | 3.12               | 42.9 | 4.50           | 14.0 |
|         |                                                  | 75         |           | 2.99               | 38.6 | 4.11           | 14.7 |
|         |                                                  | 100        |           | 3.04               | 25.7 | 5.61           | 15.2 |
|         |                                                  | 75         | yes       | 3.06               | 41.2 | 5.60           | 13.8 |
|         |                                                  | 100        | yes       | 3.18               | 33.4 | 8.77           | 12.6 |
| 14      | Dodge Challenger<br>225-CID<br>Manual<br>3500 lb | 25         |           | 4.76               | 33.0 | 3.58           | 16.1 |
|         |                                                  | 50         |           | 4.27               | 33.5 | 3.59           | 17.0 |
|         |                                                  | 75         |           | 2.91               | 19.6 | 3.94           | 18.7 |
|         |                                                  | 100        |           | 3.08               | 20.0 | 3.92           | 19.4 |
| 15      | Ford Maverick<br>200-CID<br>Auto<br>3000 lb      | 25         |           | 3.00               | 12.2 | 3.90           | 15.5 |
|         |                                                  | 50         |           | 2.12               | 6.2  | 3.56           | 17.5 |
|         |                                                  | 75         |           | 2.47               | 6.3  | 3.86           | 18.6 |
|         |                                                  | 100        |           | 2.54               | 3.9  | 4.60           | 19.8 |
|         |                                                  | 75         | yes       | 2.64               | 5.6  | 4.94           | 17.9 |
|         |                                                  | 100        | yes       | 2.59               | 4.2  | 6.51           | 17.8 |

# APPENDIX A

TABLE A-1. - Summary of results - baseline vehicles (1970 MY)--Continued

| Car No. | Vehicle description                     | Temp., ° F | Air cond. | FTP emissions, gpm |      | Fuel econ, mpg |      |
|---------|-----------------------------------------|------------|-----------|--------------------|------|----------------|------|
|         |                                         |            |           | HC                 | CO   | FTP            | HFET |
| 16      | Chevrolet Monte 350-CID Auto 4000 lb    | 25         |           | 3.72               | 37.9 | 11.7           | 18.8 |
|         |                                         | 50         |           | 3.31               | 31.4 | 12.2           | 19.3 |
|         |                                         | 75         |           | 3.06               | 22.5 | 13.2           | 19.8 |
|         |                                         | 100        |           | 3.12               | 18.0 | 13.6           | 20.3 |
|         |                                         | 75         | yes       | 2.87               | 23.0 | 12.4           | 19.4 |
| 17      | Ford Fairlane 302-CID Auto 4000 lb      | 100        | yes       | 2.88               | 21.7 | 12.1           | 18.0 |
|         |                                         | 25         |           | 4.14               | 42.0 | 11.2           | 18.6 |
|         |                                         | 50         |           | 3.27               | 30.3 | 12.6           | 19.6 |
|         |                                         | 75         |           | 3.34               | 21.6 | 13.1           | 19.7 |
|         |                                         | 100        |           | 2.74               | 9.3  | 13.5           | 20.1 |
| 18      | Chevrolet Camino 350-CID Manual 4000 lb | 25         |           | 8.11               | 39.8 | 11.7           | 19.7 |
|         |                                         | 50         |           | 5.80               | 37.1 | 14.0           | 21.0 |
|         |                                         | 75         |           | 5.33               | 34.9 | 14.0           | 21.5 |
|         |                                         | 100        |           | 4.90               | 31.0 | 14.5           | 22.0 |
|         |                                         | 25         |           | 2.58               | 16.3 | 9.6            | 16.0 |
| 19      | Cadillac 472-CID Auto 5500 lb           | 50         |           | 2.64               | 22.6 | 10.5           | 16.7 |
|         |                                         | 75         |           | 2.62               | 14.2 | 10.8           | 17.3 |
|         |                                         | 100        |           | 2.11               | 9.9  | 11.3           | 17.8 |
|         |                                         | 25         |           | 4.72               | 67.7 | 10.3           | 17.4 |
|         |                                         | 50         |           | 4.12               | 65.7 | 10.8           | 18.3 |
| 20      | Chrysler Newport 383-CID Auto 5000 lb   | 75         |           | 3.59               | 46.2 | 11.7           | 18.1 |
|         |                                         | 100        |           | 2.60               | 31.4 | 12.5           | 19.4 |
|         |                                         | 75         | yes       | 3.70               | 48.4 | 11.2           | 17.3 |
|         |                                         | 100        | yes       | 3.43               | 45.9 | 11.5           | 17.2 |
|         |                                         | 25         |           | 4.12               | 65.7 | 10.8           | 18.3 |

# APPENDIX A

TABLE A-1. - Summary of results - baseline vehicles (1970 MY)--Continued

| Car No. | Vehicle description                            | Temp., ° F | Air cond. | FTP emissions, gpm |      |      | Fuel econ, mpg |      |
|---------|------------------------------------------------|------------|-----------|--------------------|------|------|----------------|------|
|         |                                                |            |           | HC                 | CO   | NOx  | FTP            | HFET |
| 21      | Ford Maverick<br>170-CID<br>Manual<br>3000 lb  | 25         |           | 3.86               | 18.2 | 2.66 | 17.1           | 28.5 |
|         |                                                | 50         |           | 3.81               | 19.4 | 2.61 | 19.9           | 28.5 |
|         |                                                | 75         |           | 2.82               | 6.1  | 2.26 | 20.8           | 30.9 |
|         |                                                | 100        |           | 3.59               | 13.7 | 2.74 | 22.6           | 33.8 |
| 22      | AMC Hornet<br>232-CID<br>Manual<br>3000 lb     | 25         |           | 4.17               | 17.9 | 3.32 | 16.1           | 24.0 |
|         |                                                | 50         |           | 3.32               | 12.4 | 3.72 | 17.7           | 25.0 |
|         |                                                | 75         |           | 3.06               | 13.2 | 3.99 | 19.2           | 25.6 |
|         |                                                | 100        |           | 3.52               | 10.0 | 4.02 | 20.2           | 26.3 |
| 23      | Oldsmobile Vista<br>350-CID<br>Auto<br>5000 lb | 25         |           | 3.26               | 49.3 | 3.14 | 9.3            | 14.8 |
|         |                                                | 50         |           | 3.18               | 45.3 | 2.97 | 10.2           | 15.5 |
|         |                                                | 75         |           | 2.75               | 48.9 | 3.03 | 10.1           | 15.1 |
|         |                                                | 100        |           | 3.12               | 43.9 | 3.06 | 10.7           | 16.1 |
|         |                                                | 75         | yes       | 2.73               | 51.6 | 4.05 | 9.6            | 14.1 |
|         |                                                | 100        | yes       | 3.38               | 50.3 | 4.35 | 9.7            | 14.2 |
| 24      | Volkswagen Bug<br>1.6 L<br>Manual<br>2500 lb   | 25         |           | 3.39               | 26.2 | 3.59 | 21.4           | 32.2 |
|         |                                                | 50         |           | 3.06               | 21.2 | 3.42 | 23.3           | 33.5 |
|         |                                                | 75         |           | 2.41               | 18.3 | 3.47 | 24.1           | 34.4 |
|         |                                                | 100        |           | 2.18               | 21.3 | 3.51 | 24.3           | 35.1 |
| 25      | Chevrolet Nova<br>250-CID<br>Auto<br>3500 lb   | 25         |           | 4.81               | 32.8 | 2.44 | 13.4           | 23.8 |
|         |                                                | 50         |           | 4.01               | 27.6 | 2.54 | 14.4           | 25.3 |
|         |                                                | 75         |           | 3.61               | 19.9 | 2.54 | 15.8           | 25.8 |
|         |                                                | 100        |           | 3.18               | 13.3 | 2.60 | 16.5           | 26.1 |

APPENDIX A

TABLE A-1. - Summary of results - baseline vehicles (1970 MY)--Continued

| Car No. | Vehicle description                            | Temp., ° F | Air cond. | FTP emissions, gpm |      |      | Fuel econ, mpg |      |
|---------|------------------------------------------------|------------|-----------|--------------------|------|------|----------------|------|
|         |                                                |            |           | HC                 | CO   | NOx  | FTP            | HFET |
| 26      | Chevrolet Impala<br>350-V8<br>Auto<br>4500 lb  | 25         |           | 3.68               | 67.6 | 4.22 | 11.0           | 18.7 |
|         |                                                | 50         |           | 3.02               | 44.4 | 4.07 | 12.5           | 20.0 |
|         |                                                | 75         |           | 2.68               | 35.7 | 4.97 | 12.3           | 19.3 |
|         |                                                | 100        |           | 2.48               | 28.2 | 4.34 | 14.0           | 20.0 |
|         |                                                | 75         | yes       | 2.68               | 35.4 | 5.17 | 12.1           | 19.1 |
| 27      | Ford Galaxy<br>351-CID<br>Auto<br>4500 lb      | 100        | yes       | 2.79               | 37.4 | 5.41 | 12.3           | 17.8 |
|         |                                                | 25         |           | 5.56               | 65.9 | 4.69 | 10.9           | 18.8 |
|         |                                                | 50         |           | 3.02               | 33.5 | 4.40 | 12.8           | 19.7 |
|         |                                                | 75         |           | 3.00               | 16.8 | 6.03 | 13.0           | 20.6 |
|         |                                                | 100        |           | 2.68               | 15.6 | 6.06 | 13.6           | 21.0 |
| 28      | Plymouth Valiant<br>225-CID<br>Auto<br>3500 lb | 75         | yes       | 2.81               | 18.1 | 5.84 | 12.6           | 19.7 |
|         |                                                | 100        | yes       | 2.93               | 12.7 | 6.71 | 12.8           | 18.9 |
|         |                                                | 25         |           | 8.88               | 77.3 | 6.30 | 14.7           | 21.8 |
|         |                                                | 50         |           | 5.59               | 50.4 | 6.79 | 16.7           | 25.8 |
|         |                                                | 75         |           | 3.89               | 36.3 | 7.09 | 18.7           | 25.5 |
| 29      | Chevrolet Vega<br>140-CID<br>Manual<br>3000 lb | 100        |           | 2.61               | 24.1 | 7.90 | 19.7           | 26.5 |
|         |                                                | 25         |           | 2.40               | 34.6 | 2.72 | 19.2           | 32.6 |
|         |                                                | 50         |           | 3.31               | 40.4 | 2.43 | 23.5           | 36.8 |
|         |                                                | 75         |           | 2.38               | 31.5 | 3.02 | 24.5           | 36.8 |
|         |                                                | 100        |           | 2.49               | 35.8 | 2.54 | 22.1           | 36.7 |
| 30      | Ford Wagon<br>429-CID<br>Auto<br>5500 lb       | 25         |           | 2.69               | 35.2 | 4.77 | 9.0            | 16.4 |
|         |                                                | 50         |           | 2.58               | 29.0 | 4.89 | 9.9            | 16.9 |
|         |                                                | 75         |           | 2.48               | 21.0 | 5.47 | 10.3           | 17.7 |
|         |                                                | 100        |           | 2.58               | 20.1 | 5.64 | 10.5           | 17.1 |
|         |                                                | 75         | yes       | 2.40               | 28.5 | 5.72 | 9.8            | 16.3 |
|         |                                                | 100        | yes       | 2.71               | 25.6 | 5.90 | 9.9            | 15.9 |

# APPENDIX A

TABLE A-2. - Summary of results - production late model

| Car No. | Vehicle description                                  | Temp., ° F | Air cond. | FTP emissions, gpm |      | Fuel econ, mpg |      |
|---------|------------------------------------------------------|------------|-----------|--------------------|------|----------------|------|
|         |                                                      |            |           | HC                 | CO   | FTP            | HFET |
| 1       | 1978 Buick Skyhawk<br>231-CID<br>Auto<br>3500 lb     | 25         |           | 1.26               | 6.2  | 14.9           | 22.1 |
|         |                                                      | 50         |           | 0.58               | 4.6  | 15.9           | 22.6 |
|         |                                                      | 75         |           | 0.42               | 2.5  | 15.9           | 22.9 |
|         |                                                      | 100        |           | 0.39               | 3.4  | 17.8           | 24.4 |
|         |                                                      | 75         | yes       | 0.52               | 3.6  | 15.2           | 21.9 |
| 2       | 1978 Pontiac Sunbird<br>151-CID<br>Auto<br>3500 lb   | 100        | yes       | 0.50               | 4.3  | 15.2           | 21.1 |
|         |                                                      | 25         |           | 2.45               | 49.0 | 15.0           | 22.6 |
|         |                                                      | 50         |           | 1.05               | 30.0 | 16.3           | 24.1 |
|         |                                                      | 75         |           | 0.53               | 11.7 | 17.6           | 25.8 |
|         |                                                      | 100        |           | 0.58               | 10.2 | 19.2           | 25.6 |
| 3       | 1979 Ford Turbo Mustang<br>2.3L<br>Manual<br>3000 lb | 75         | yes       | 0.49               | 11.4 | 16.8           | 24.0 |
|         |                                                      | 100        | yes       | 0.60               | 13.4 | 17.1           | 22.8 |
|         |                                                      | 25         |           | 4.21               | 30.5 | 13.7           | 24.4 |
|         |                                                      | 50         |           | 2.25               | 16.2 | 14.6           | 24.8 |
|         |                                                      | 75         |           | 1.01               | 6.3  | 15.6           | 24.7 |
| 4       | 1979 Dodge Challenger<br>1.6L<br>Manual<br>3000 lb   | 100        | yes       | 0.68               | 5.4  | 16.0           | 26.1 |
|         |                                                      | 75         | yes       | 0.78               | 6.3  | 13.4           | 21.4 |
|         |                                                      | 100        |           | 1.17               | 8.9  | 14.9           | 24.3 |
|         |                                                      | 25         |           | 1.48               | 15.4 | 20.9           | 30.6 |
|         |                                                      | 50         |           | 1.11               | 15.6 | 22.5           | 30.7 |
|         |                                                      | 75         |           | 0.97               | 8.6  | 24.3           | 32.8 |
|         |                                                      | 100        |           | 0.99               | 11.5 | 24.3           | 33.1 |
|         |                                                      | 75         | yes       | 0.84               | 8.4  | 23.5           | 32.0 |
|         |                                                      | 100        | yes       | 0.91               | 15.4 | 21.4           | 31.5 |

# APPENDIX A

TABLE A-2. - Summary of results - production late model--Continued

| Car No. | Vehicle description                         | Temp., ° F | Air cond. | FTP emissions, gpm |      | Fuel econ, mpg |      |
|---------|---------------------------------------------|------------|-----------|--------------------|------|----------------|------|
|         |                                             |            |           | HC                 | CO   | FTP            | HFET |
| 5       | 1979 Oldsmobile Diesel 260-CID Auto 4000 lb | 25         |           | 0.36               | 1.6  | 18.0           | 27.7 |
|         |                                             | 50         |           | 0.32               | 1.5  | 18.4           | 27.9 |
|         |                                             | 75         |           | 0.33               | 1.6  | 18.8           | 28.8 |
|         |                                             | 100        |           | 0.32               | 1.6  | 21.2           | 29.8 |
|         |                                             | 75         | yes       | 0.35               | 1.7  | 17.8           | 27.7 |
| 6       | 1979 BMW 528i 2.8L Manual 3500 lb           | 100        | yes       | 0.46               | 2.0  | 16.6           | 24.7 |
|         |                                             | 25         |           | 1.20               | 14.4 | 13.5           | 23.9 |
|         |                                             | 50         |           | 0.71               | 5.6  | 16.6           | 25.2 |
|         |                                             | 75         |           | 0.43               | 3.9  | 17.0           | 26.3 |
|         |                                             | 100        |           | 0.46               | 2.5  | 17.7           | 27.2 |
| 7       | 1980 VW Rabbit Diesel 1.5L Manual 2250 lb   | 75         | yes       | 0.49               | 4.9  | 15.9           | 25.2 |
|         |                                             | 100        | yes       | 0.48               | 2.3  | 15.1           | 23.6 |
|         |                                             | 25         |           | 0.40               | 1.3  | 32.3           | 39.8 |
|         |                                             | 50         |           | 0.25               | 1.1  | 35.4           | 43.6 |
|         |                                             | 75         |           | 0.28               | 0.9  | 35.9           | 41.9 |
|         |                                             | 100        |           | 0.30               | 1.1  | 37.9           | 42.4 |
|         |                                             | 75         | yes       | 0.30               | 1.1  | 32.3           | 40.8 |
|         |                                             | 100        | yes       | 0.32               | 1.2  | 27.4           | 36.0 |

APPENDIX B. - HC EMISSIONS, GPM

# APPENDIX B

TABLE B-1. - HC emissions, gpm - baseline vehicles (1970 MY)

| Car No. | Temp., ° F | Air cond. | Urban FTP |      |      |       | Urban | HFET | 55/45 |      | NYCC |
|---------|------------|-----------|-----------|------|------|-------|-------|------|-------|------|------|
|         |            |           | CT        | ST   | HT   | Comp. |       |      |       |      |      |
| 1       | 25         |           | 11.77     | 2.44 | 2.26 | 4.32  | 1.50  | 3.05 |       | 3.44 |      |
|         | 50         |           | 7.27      | 2.54 | 2.52 | 3.52  | 1.60  | 2.66 |       | 4.56 |      |
|         | 75         |           | 4.36      | 2.49 | 2.55 | 2.89  | 1.35  | 2.42 |       | 4.04 |      |
|         | 100        |           | 2.73      | 2.38 | 2.40 | 2.46  | 1.73  | 2.15 |       | 5.06 |      |
|         | 75         | Yes       | 4.34      | 2.65 | 2.66 | 3.01  | 1.92  | 2.52 |       | 4.56 |      |
| 2       | 100        | Yes       | 3.60      | 2.90 | 3.01 | 3.07  | 2.20  | 2.63 |       | 5.52 |      |
|         | 25         |           | 10.54     | 2.88 | 2.58 | 4.39  | 1.30  | 3.22 |       | 4.24 |      |
|         | 50         |           | 6.90      | 2.54 | 2.41 | 3.42  | 1.65  | 2.62 |       | 3.70 |      |
|         | 75         |           | 3.38      | 2.49 | 2.44 | 2.66  | 1.72  | 2.24 |       | 4.37 |      |
|         | 100        |           | 3.04      | 2.66 | 2.66 | 2.74  | 1.91  | 2.37 |       | 4.76 |      |
| 3       | 75         | Yes       | 4.48      | 2.89 | 2.58 | 3.13  | 1.92  | 2.59 |       | 5.01 |      |
|         | 100        | Yes       | 3.55      | 2.89 | 2.64 | 2.96  | 2.01  | 2.53 |       | 7.32 |      |
|         | 25         |           | 7.52      | 3.70 | 3.10 | 4.32  | 1.37  | 3.22 |       | 6.50 |      |
|         | 50         |           | 6.05      | 4.24 | 3.14 | 4.31  | 2.03  | 3.23 |       | 6.39 |      |
|         | 75         |           | 4.10      | 3.91 | 3.17 | 3.74  | 2.01  | 2.96 |       | 6.41 |      |
| 4       | 100        |           | 3.76      | 3.86 | 3.16 | 3.65  | 2.02  | 2.92 |       | 6.60 |      |
|         | 75         | Yes       | 4.36      | 3.85 | 3.10 | 3.75  | 2.11  | 3.01 |       | 6.75 |      |
|         | 100        | Yes       | 3.70      | 3.67 | 3.05 | 3.51  | 2.02  | 2.84 |       | 6.48 |      |
|         | 25         |           | 9.24      | 4.30 | 3.83 | 5.20  | 2.30  | 3.90 |       | 7.86 |      |
|         | 50         |           | 7.17      | 3.31 | 3.96 | 4.28  | 2.41  | 3.44 |       | 6.77 |      |
| 5       | 75         |           | 5.72      | 3.35 | 3.57 | 3.90  | 2.51  | 3.27 |       | 9.03 |      |
|         | 100        |           | 4.24      | 3.83 | 4.02 | 3.97  | 2.72  | 3.41 |       | 9.86 |      |
|         | 75         | Yes       | 4.95      | 3.60 | 3.58 | 3.87  | 2.64  | 3.32 |       | 8.62 |      |
|         | 100        | Yes       | 4.05      | 3.90 | 4.04 | 3.97  | 2.88  | 3.48 |       | 9.62 |      |
|         | 25         |           | 5.52      | 2.86 | 2.56 | 3.33  | 1.76  | 2.52 |       | 5.00 |      |
|         | 50         |           | 3.78      | 2.55 | 2.29 | 2.73  | 1.45  | 2.15 |       | 4.53 |      |
|         | 75         |           | 3.76      | 2.76 | 2.71 | 2.96  | 1.34  | 2.46 |       | 5.84 |      |
|         | 100        |           | 3.30      | 2.43 | 2.75 | 2.72  | 1.39  | 2.35 |       | 5.85 |      |
|         | 75         | Yes       | 3.95      | 2.70 | 2.59 | 2.93  | 1.99  | 2.51 |       | 5.83 |      |
|         | 100        | Yes       | 4.25      | 3.86 | 3.64 | 3.38  | 2.43  | 3.25 |       | 3.30 |      |

# APPENDIX B

TABLE B-1. - HC emissions, gpm - baseline vehicles (1970 MY) --Continued

| Car No. | Temp., ° F | Air cond. | Urban FTP |      |      | Urban | HFET | 55/45 |       | NYCC |
|---------|------------|-----------|-----------|------|------|-------|------|-------|-------|------|
|         |            |           | CT        | ST   | HT   |       |      | Comp. |       |      |
| 6       | 25         |           | 9.20      | 1.84 | 1.32 | 3.36  | 1.42 | 2.49  | 2.18  |      |
|         | 50         |           | 3.97      | 1.74 | 1.79 | 2.21  | 1.35 | 1.82  | 2.66  |      |
|         | 75         |           | 3.80      | 1.71 | 1.87 | 2.19  | 1.55 | 1.90  | 3.47  |      |
|         | 100        |           | 2.06      | 2.40 | 2.47 | 2.35  | 1.58 | 2.00  | 5.03  |      |
|         | 75         | Yes       | 3.84      | 1.87 | 2.62 | 2.49  | 1.46 | 2.03  | 3.36  |      |
| 7       | 100        | Yes       | 2.02      | 1.80 | 2.18 | 1.95  | 1.43 | 1.72  | 5.38  |      |
|         | 25         |           | 5.54      | 1.85 | 1.86 | 2.62  | 1.06 | 1.92  | 2.48  |      |
|         | 50         |           | 3.64      | 1.93 | 2.04 | 2.32  | 1.37 | 1.89  | 2.75  |      |
|         | 75         |           | 2.70      | 1.72 | 2.04 | 2.01  | 1.38 | 1.73  | 2.82  |      |
|         | 100        |           | 2.53      | 1.73 | 2.44 | 2.12  | 1.80 | 1.98  | 3.98  |      |
| 3       | 25         |           | 13.92     | 3.19 | 3.40 | 5.43  | 1.16 | 3.51  | 5.68  |      |
|         | 50         |           | 8.45      | 2.36 | 2.50 | 3.66  | 0.92 | 2.43  | 5.15  |      |
|         | 75         |           | 3.86      | 2.37 | 1.88 | 2.54  | 1.02 | 1.86  | 3.87  |      |
|         | 100        |           | 3.75      | 2.14 | 2.33 | 2.52  | 1.09 | 1.88  | 4.90  |      |
|         | 75         | Yes       | 3.93      | 2.57 | 2.30 | 2.79  | 1.09 | 2.03  | 5.97  |      |
| 9       | 100        | Yes       | 3.10      | 2.38 | 2.35 | 2.52  | 1.34 | 1.99  | 8.51  |      |
|         | 25         |           | 6.17      | 3.61 | 3.18 | 4.02  | 1.66 | 2.96  | 10.16 |      |
|         | 50         |           | 4.55      | 3.11 | 3.55 | 3.53  | 1.60 | 2.66  | 3.17  |      |
|         | 75         |           | 4.24      | 3.54 | 3.33 | 3.63  | 1.73 | 2.78  | 10.47 |      |
|         | 100        |           | 4.46      | 5.16 | 4.42 | 4.81  | 1.96 | 3.53  | 16.63 |      |
| 10      | 75         | Yes       | 4.74      | 3.79 | 3.94 | 4.03  | 1.91 | 3.03  | 9.36  |      |
|         | 100        | Yes       | 4.45      | 4.18 | 3.70 | 4.11  | 1.92 | 3.12  | 13.87 |      |
|         | 25         |           | 10.48     | 4.60 | 3.72 | 5.58  | 2.38 | 4.14  | 7.77  |      |
|         | 50         |           | 7.42      | 4.78 | 4.11 | 5.14  | 2.69 | 4.04  | 9.65  |      |
|         | 75         |           | 5.71      | 4.53 | 4.14 | 4.69  | 2.52 | 3.71  | 9.72  |      |
|         | 100        |           | 4.64      | 4.38 | 4.06 | 4.35  | 2.69 | 3.60  | 9.00  |      |

# APPENDIX B

TABLE B-1. - HC emissions, gpm - baseline vehicles (1970 MY)--Continued

| Car No. | Temp., ° F | Air cond. | Urban FTP |      |      |       | 55/45 |       | NYCC  |
|---------|------------|-----------|-----------|------|------|-------|-------|-------|-------|
|         |            |           | CT        | ST   | HT   | Urban | HFET  | Comp. |       |
| 11      | 25         |           | 10.29     | 2.08 | 2.23 | 3.82  | 0.76  | 2.44  | 3.64  |
|         | 50         |           | 8.62      | 2.43 | 2.38 | 3.71  | 0.55  | 2.29  | 3.95  |
|         | 75         |           | 5.61      | 1.66 | 2.03 | 2.58  | 0.72  | 1.74  | 3.92  |
|         | 100        |           | 3.95      | 1.91 | 2.28 | 2.44  | 0.82  | 1.71  | 4.71  |
| 12      | 25         |           | 10.17     | 3.17 | 3.26 | 4.64  | 2.16  | 3.52  | 4.77  |
|         | 50         |           | 5.25      | 3.38 | 3.15 | 3.70  | 2.38  | 3.11  | 4.96  |
|         | 75         |           | 3.69      | 3.05 | 3.02 | 3.17  | 2.00  | 2.64  | 5.37  |
|         | 100        |           | 3.82      | 3.33 | 3.17 | 3.38  | 2.29  | 2.89  | 6.48  |
|         | 75         | Yes       | 4.27      | 3.55 | 3.29 | 3.63  | 2.29  | 3.03  | 5.59  |
|         | 100        | Yes       | 4.30      | 3.91 | 3.96 | 4.00  | 2.75  | 3.44  | 10.03 |
| 13      | 25         |           | 8.30      | 3.20 | 2.82 | 4.24  | 1.79  | 3.14  | 5.20  |
|         | 50         |           | 4.55      | 2.73 | 2.76 | 3.12  | 1.80  | 2.53  | 5.73  |
|         | 75         |           | 3.93      | 2.73 | 2.79 | 2.99  | 1.95  | 2.52  | 6.03  |
|         | 100        |           | 3.48      | 2.86 | 3.08 | 3.04  | 1.97  | 2.56  | 5.61  |
|         | 75         | Yes       | 4.20      | 3.05 | 2.21 | 3.06  | 1.99  | 2.58  | 5.27  |
|         | 100        | Yes       | 3.35      | 3.23 | 2.97 | 3.18  | 2.23  | 2.75  | 8.64  |
| 14      | 25         |           | 10.54     | 3.56 | 2.76 | 4.76  | 1.16  | 3.14  | 3.43  |
|         | 50         |           | 8.74      | 3.36 | 2.66 | 4.27  | 1.10  | 2.84  | 7.39  |
|         | 75         |           | 3.46      | 2.85 | 2.58 | 2.91  | 1.13  | 2.11  | 9.59  |
|         | 100        |           | 3.56      | 2.96 | 2.99 | 3.08  | 1.12  | 2.20  | 9.09  |
| 15      | 25         |           | 5.40      | 2.43 | 2.13 | 3.00  | 0.92  | 2.06  | 4.29  |
|         | 50         |           | 2.55      | 2.11 | 1.33 | 2.12  | 0.87  | 1.56  | 4.54  |
|         | 75         |           | 3.19      | 2.37 | 2.12 | 2.47  | 1.47  | 2.02  | 6.71  |
|         | 100        |           | 2.32      | 2.64 | 2.52 | 2.54  | 1.54  | 2.09  | 6.54  |
|         | 75         | Yes       | 2.66      | 2.82 | 2.28 | 2.54  | 1.43  | 2.10  | 6.82  |
|         | 100        | Yes       | 2.47      | 2.70 | 2.48 | 2.59  | 1.53  | 2.11  | 7.57  |

# APPENDIX B

TABLE B-1. - HC emissions, gpm - baseline vehicles (1970 MY) --Continued

| Car No. | Temp., ° F | Air cond. | Urban FTP |      |      |       | HFET | 55/45 |       | NYCC |
|---------|------------|-----------|-----------|------|------|-------|------|-------|-------|------|
|         |            |           | CT        | ST   | HT   | Urban |      | Comp. |       |      |
| 16      | 25         |           | 7.13      | 3.04 | 2.42 | 3.72  | 0.95 | 2.47  | 5.33  |      |
|         | 50         |           | 5.82      | 2.89 | 2.25 | 3.31  | 0.76 | 2.16  | 5.06  |      |
|         | 75         |           | 4.09      | 2.80 | 2.75 | 3.06  | 1.10 | 2.13  | 6.01  |      |
|         | 100        |           | 3.54      | 3.08 | 2.91 | 3.12  | 1.33 | 2.31  | 6.74  |      |
|         | 75         | Yes       | 3.94      | 2.75 | 2.35 | 2.87  | 1.06 | 2.06  | 6.50  |      |
| 17      | 100        | Yes       | 3.32      | 2.70 | 2.73 | 2.88  | 1.28 | 2.16  | 6.10  |      |
|         | 25         |           | 10.44     | 2.50 | 2.49 | 4.14  | 1.61 | 3.00  | 4.41  |      |
|         | 50         |           | 6.46      | 2.42 | 2.47 | 3.27  | 1.71 | 2.57  | 4.64  |      |
|         | 75         |           | 5.05      | 2.89 | 2.89 | 3.34  | 1.96 | 2.72  | 5.82  |      |
|         | 100        |           | 3.22      | 2.46 | 2.90 | 2.74  | 2.00 | 2.41  | 5.14  |      |
| 18      | 25         |           | 13.02     | 7.54 | 5.58 | 8.11  | 2.64 | 5.65  | 15.94 |      |
|         | 50         |           | 8.33      | 5.30 | 4.84 | 5.80  | 2.84 | 4.47  | 12.57 |      |
|         | 75         |           | 6.85      | 4.94 | 4.94 | 5.33  | 2.61 | 4.11  | 15.25 |      |
|         | 100        |           | 5.53      | 4.62 | 4.95 | 4.90  | 2.56 | 3.85  | 15.20 |      |
|         | 25         |           | 4.60      | 2.06 | 2.04 | 2.58  | 1.48 | 2.09  | 2.32  |      |
| 19      | 50         |           | 4.21      | 2.17 | 2.35 | 2.64  | 1.46 | 2.11  | 3.08  |      |
|         | 75         |           | 3.25      | 2.51 | 2.35 | 2.62  | 1.63 | 2.17  | 3.34  |      |
|         | 100        |           | 2.40      | 1.80 | 2.43 | 2.11  | 1.56 | 1.36  | 3.32  |      |
|         | 25         |           | 9.81      | 3.54 | 3.12 | 4.72  | 1.09 | 3.09  | 6.24  |      |
|         | 50         |           | 5.59      | 3.73 | 3.76 | 4.12  | 1.13 | 2.80  | 5.92  |      |
| 20      | 75         |           | 4.64      | 3.55 | 2.83 | 3.59  | 1.24 | 2.53  | 5.91  |      |
|         | 100        |           | 3.05      | 2.43 | 2.50 | 2.60  | 1.00 | 1.88  | 5.46  |      |
|         | 75         | Yes       | 5.10      | 3.47 | 3.06 | 3.70  | 1.39 | 2.66  | 5.74  |      |
|         | 100        | Yes       | 3.94      | 3.32 | 3.26 | 3.43  | 1.66 | 2.63  | 5.98  |      |

# APPENDIX B

TABLE B-1. - HC emissions, gpm - baseline vehicles (1970 MY)--Continued

| Car No. | Temp., ° F | Air cond. | Urban FTP |      |      |       | HFET | 55/45 |       | NYCC |
|---------|------------|-----------|-----------|------|------|-------|------|-------|-------|------|
|         |            |           | CT        | ST   | HT   | Urban |      | Comp. |       |      |
| 21      | 25         |           | 8.06      | 2.80 | 2.67 | 3.86  | 1.40 | 2.75  | 6.90  |      |
|         | 50         |           | 7.48      | 2.74 | 3.07 | 3.81  | 1.39 | 2.72  | 6.41  |      |
|         | 75         |           | 3.15      | 2.67 | 2.85 | 2.82  | 1.47 | 2.21  | 7.80  |      |
|         | 100        |           | 4.42      | 3.38 | 3.42 | 3.59  | 1.68 | 2.73  | 10.03 |      |
| 22      | 25         |           | 6.39      | 4.20 | 2.48 | 4.17  | 0.70 | 2.61  | 7.10  |      |
|         | 50         |           | 4.28      | 3.31 | 2.63 | 3.32  | 0.83 | 2.20  | 6.73  |      |
|         | 75         |           | 2.93      | 3.24 | 2.32 | 3.06  | 0.93 | 2.12  | 9.08  |      |
|         | 100        |           | 2.86      | 3.99 | 3.10 | 3.52  | 1.11 | 2.44  | 10.15 |      |
| 23      | 25         |           | 6.73      | 2.24 | 2.48 | 3.26  | 1.61 | 2.52  | 4.56  |      |
|         | 50         |           | 4.92      | 2.46 | 3.20 | 3.18  | 1.66 | 2.50  | 5.97  |      |
|         | 75         |           | 3.92      | 2.41 | 2.53 | 2.75  | 1.63 | 2.25  | 5.41  |      |
|         | 100        |           | 3.28      | 3.00 | 3.24 | 3.12  | 1.66 | 2.46  | 5.17  |      |
|         | 75         | Yes       | 3.83      | 2.42 | 2.47 | 2.73  | 1.46 | 2.15  | 4.83  |      |
|         | 100        | Yes       | 3.49      | 3.27 | 3.52 | 3.38  | 2.00 | 2.76  | 10.96 |      |
| 24      | 25         |           | 8.62      | 2.04 | 2.12 | 3.39  | 0.76 | 2.21  | 6.35  |      |
|         | 50         |           | 4.70      | 2.89 | 2.15 | 3.06  | 0.70 | 2.00  | 7.52  |      |
|         | 75         |           | 3.14      | 2.25 | 2.15 | 2.41  | 0.66 | 1.62  | 6.33  |      |
|         | 100        |           | 2.74      | 2.00 | 2.10 | 2.18  | 0.70 | 1.51  | 6.16  |      |
| 25      | 25         |           | 10.35     | 3.95 | 2.31 | 4.81  | 1.03 | 3.13  | 6.38  |      |
|         | 50         |           | 7.97      | 3.29 | 2.36 | 4.01  | 1.23 | 2.76  | 5.10  |      |
|         | 75         |           | 6.25      | 3.15 | 2.49 | 3.61  | 1.13 | 2.52  | 4.20  |      |
|         | 100        |           | 4.18      | 3.12 | 2.57 | 3.13  | 1.3d | 2.37  | 5.36  |      |

# APPENDIX B

TABLE B-1. - HC emissions, gpm - baseline vehicles (1970 MY) --Continued

| Car No. | Temp., ° F | Air cond. | Urban FTP |      |      | Urban | HFET | 55/45 |      |
|---------|------------|-----------|-----------|------|------|-------|------|-------|------|
|         |            |           | CT        | ST   | HT   |       |      | Comp. | NYCC |
| 25      | 25         |           | 7.24      | 2.86 | 2.56 | 3.68  | 1.48 | 2.69  | 4.22 |
|         | 50         |           | 2.36      | 2.63 | 2.02 | 3.02  | 1.43 | 2.30  | 5.39 |
|         | 75         |           | 3.22      | 2.66 | 2.31 | 2.68  | 1.60 | 2.19  | 3.87 |
|         | 100        |           | 2.70      | 2.32 | 2.64 | 2.48  | 2.12 | 2.32  | 7.95 |
|         | 75         | Yes       | 3.27      | 2.72 | 2.15 | 2.63  | 1.67 | 2.23  | 6.24 |
| 27      | 100        | Yes       | 2.89      | 2.83 | 2.64 | 2.79  | 1.94 | 2.41  | 5.21 |
|         | 25         |           | 14.34     | 3.48 | 2.44 | 5.56  | 1.30 | 3.64  | 4.48 |
|         | 50         |           | 5.16      | 2.73 | 1.99 | 3.02  | 1.17 | 2.19  | 3.53 |
|         | 75         |           | 4.21      | 2.33 | 2.34 | 3.00  | 1.40 | 2.28  | 4.23 |
|         | 100        |           | 3.61      | 2.38 | 2.54 | 2.68  | 1.43 | 2.12  | 5.17 |
| 23      | 75         | Yes       | 4.19      | 2.55 | 2.23 | 2.81  | 1.31 | 2.14  | 4.64 |
|         | 100        | Yes       | 3.85      | 2.80 | 2.50 | 2.93  | 1.73 | 2.39  | 3.16 |
|         | 25         |           | 26.41     | 4.82 | 3.42 | 8.88  | 2.23 | 5.91  | 6.43 |
|         | 50         |           | 15.49     | 3.33 | 2.38 | 5.59  | 1.46 | 3.73  | 4.32 |
|         | 75         |           | 8.49      | 2.92 | 2.29 | 3.89  | 1.57 | 2.35  | 4.60 |
| 29      | 100        |           | 3.94      | 2.37 | 2.07 | 2.61  | 1.45 | 2.09  | 4.34 |
|         | 25         |           | 3.32      | 2.12 | 1.86 | 2.40  | 1.09 | 1.31  | 4.52 |
|         | 50         |           | 6.33      | 2.43 | 2.59 | 3.31  | 1.03 | 2.28  | 5.24 |
|         | 75         |           | 3.14      | 2.24 | 2.09 | 2.38  | 0.95 | 1.74  | 6.75 |
|         | 100        |           | 2.31      | 2.74 | 2.15 | 2.49  | 1.14 | 1.30  | 3.10 |
| 30      | 25         |           | 6.70      | 1.30 | 1.93 | 2.69  | 1.70 | 2.24  | 2.54 |
|         | 50         |           | 5.29      | 1.47 | 2.62 | 2.58  | 2.24 | 2.43  | 4.19 |
|         | 75         |           | 3.88      | 1.73 | 2.78 | 2.48  | 2.27 | 2.39  | 3.83 |
|         | 100        |           | 3.77      | 1.39 | 3.01 | 2.58  | 2.56 | 2.57  | 5.83 |
|         | 75         | Yes       | 4.51      | 1.43 | 2.70 | 2.40  | 2.24 | 2.33  | 4.35 |
| 30      | 100        | Yes       | 3.03      | 2.34 | 3.17 | 2.71  | 2.75 | 2.73  | 7.38 |

# APPENDIX B

TABLE B-2. - HC emissions, gpm - production late model

| Car No. | Temp., ° F | Air cond. | Urban FTP |      |      |       | 55/45 |       | NYCC |
|---------|------------|-----------|-----------|------|------|-------|-------|-------|------|
|         |            |           | CT        | ST   | HT   | Urban | HFET  | Comp. |      |
| 1       | 25         |           | 4.89      | 0.30 | 0.35 | 1.26  | 0.06  | 0.72  | 0.30 |
|         | 50         |           | 2.17      | 0.12 | 0.24 | 0.58  | 0.05  | 0.34  | 0.26 |
|         | 75         |           | 1.57      | 0.12 | 0.14 | 0.42  | 0.04  | 0.25  | 0.22 |
|         | 100        |           | 1.22      | 0.12 | 0.23 | 0.39  | 0.04  | 0.23  | 0.27 |
|         | 75         | Yes       | 1.94      | 0.12 | 0.22 | 0.52  | 0.03  | 0.30  | 0.15 |
| 2       | 100        | Yes       | 1.53      | 0.21 | 0.29 | 0.50  | 0.15  | 0.34  | 0.45 |
|         | 25         |           | 10.26     | 0.42 | 0.37 | 2.45  | 0.05  | 1.37  | 0.20 |
|         | 50         |           | 4.47      | 0.15 | 0.15 | 1.05  | 0.01  | 0.58  | 0.00 |
|         | 75         |           | 1.94      | 0.11 | 0.25 | 0.53  | 0.04  | 0.31  | 0.06 |
|         | 100        |           | 1.60      | 0.10 | 0.68 | 0.58  | 0.06  | 0.35  | 2.30 |
| 3       | 75         | Yes       | 1.82      | 0.08 | 0.27 | 0.49  | 0.04  | 0.29  | 0.14 |
|         | 100        | Yes       | 1.43      | 0.13 | 0.36 | 0.60  | 0.59  | 0.60  | 3.81 |
|         | 25         |           | 16.86     | 0.94 | 0.90 | 4.21  | 0.12  | 2.37  | 1.21 |
|         | 50         |           | 7.84      | 0.82 | 0.71 | 2.25  | 0.11  | 1.29  | 1.30 |
|         | 75         |           | 2.72      | 0.47 | 0.76 | 1.01  | 0.03  | 0.53  | 1.75 |
| 4       | 100        |           | 1.56      | 0.36 | 0.54 | 0.63  | 0.03  | 0.41  | 4.36 |
|         | 75         | Yes       | 2.23      | 0.33 | 0.45 | 0.78  | 0.06  | 0.46  | 2.51 |
|         | 100        | Yes       | 3.50      | 0.47 | 0.75 | 1.17  | 0.07  | 0.68  | 3.36 |
|         | 25         |           | 3.46      | 1.10 | 0.70 | 1.48  | 0.30  | 0.95  | 1.85 |
|         | 50         |           | 1.66      | 0.94 | 1.02 | 1.11  | 0.26  | 0.73  | 2.05 |
|         | 75         |           | 1.14      | 1.03 | 0.74 | 0.97  | 0.24  | 0.64  | 2.08 |
|         | 100        |           | 1.19      | 0.98 | 0.96 | 0.99  | 0.24  | 0.65  | 2.48 |
|         | 75         | Yes       | 1.04      | 0.83 | 0.70 | 0.84  | 0.21  | 0.56  | 1.83 |
|         | 100        | Yes       | 1.17      | 0.77 | 0.99 | 0.91  | 0.24  | 0.61  | 2.32 |

# APPENDIX B

TABLE B-2. - HC emissions, gpm - production late model--Continued

| Car No. | Temp., ° F | Air cond. | Urban FTP |      |      | Urban | HFET | 55/45 |      |
|---------|------------|-----------|-----------|------|------|-------|------|-------|------|
|         |            |           | CT        | ST   | HT   |       |      | Comp. | NYCC |
| 5       | 25         |           | 0.71      | 0.30 | 0.22 | 0.36  | 0.11 | 0.25  | 0.83 |
|         | 50         |           | 0.56      | 0.27 | 0.22 | 0.32  | 0.13 | 0.23  | 1.03 |
|         | 75         |           | 0.54      | 0.29 | 0.25 | 0.33  | 0.13 | 0.24  | 1.10 |
|         | 100        |           | 0.43      | 0.32 | 0.22 | 0.32  | 0.08 | 0.21  | 1.04 |
|         | 75         | Yes       | 0.48      | 0.27 | 0.40 | 0.35  | 0.09 | 0.23  | 0.71 |
| 6       | 100        | Yes       | 0.63      | 0.43 | 0.37 | 0.46  | 0.10 | 0.30  | 1.03 |
|         | 25         |           | 4.18      | 0.40 | 0.42 | 1.20  | 0.16 | 0.73  | 2.05 |
|         | 50         |           | 1.89      | 0.39 | 0.44 | 0.71  | 0.13 | 0.45  | 2.24 |
|         | 75         |           | 0.92      | 0.26 | 0.38 | 0.43  | 0.10 | 0.23  | 0.56 |
|         | 100        |           | 1.17      | 0.29 | 0.24 | 0.46  | 0.09 | 0.29  | 0.74 |
| 7       | 75         | Yes       | 1.26      | 0.31 | 0.27 | 0.49  | 0.09 | 0.31  | 1.00 |
|         | 100        | Yes       | 1.35      | 0.23 | 0.31 | 0.43  | 0.11 | 0.31  | 0.67 |
|         | 25         |           | 0.63      | 0.32 | 0.31 | 0.40  | 0.24 | 0.33  | 0.54 |
|         | 50         |           | 0.30      | 0.25 | 0.22 | 0.25  | 0.19 | 0.22  | 0.31 |
|         | 75         |           | 0.35      | 0.26 | 0.26 | 0.28  | 0.22 | 0.25  | 0.58 |
|         | 100        |           | 0.30      | 0.23 | 0.33 | 0.30  | 0.32 | 0.31  | 0.60 |
|         | 75         | Yes       | 0.41      | 0.23 | 0.27 | 0.30  | 0.21 | 0.26  | 0.60 |
|         | 100        | Yes       | 0.23      | 0.32 | 0.35 | 0.32  | 0.30 | 0.31  | 0.67 |

APPENDIX C. - CO EMISSIONS, GPM

# APPENDIX C

TABLE C-1. - CO emissions, gpm - baseline vehicles (1970 MY)

| Car No. | Temp., ° F | Air cond. | Urban FTP |      |      |       | 55/45 |       | NYCC  |
|---------|------------|-----------|-----------|------|------|-------|-------|-------|-------|
|         |            |           | CT        | ST   | HT   | Urban | HFET  | Comp. |       |
| 1       | 25         |           | 177.0     | 6.8  | 9.0  | 42.3  | 4.2   | 25.2  | 17.3  |
|         | 50         |           | 99.2      | 8.1  | 10.9 | 27.8  | 5.1   | 17.6  | 21.6  |
|         | 75         |           | 39.2      | 8.3  | 12.4 | 15.8  | 6.3   | 11.5  | 26.0  |
|         | 100        |           | 10.5      | 8.3  | 13.3 | 10.1  | 7.2   | 8.3   | 23.3  |
|         | 75         | Yes       | 47.6      | 8.0  | 11.5 | 17.2  | 6.5   | 12.4  | 31.5  |
| 2       | 100        | Yes       | 19.2      | 10.5 | 18.0 | 14.3  | 9.8   | 12.3  | 56.9  |
|         | 25         |           | 189.7     | 9.7  | 9.4  | 46.9  | 5.7   | 28.4  | 12.8  |
|         | 50         |           | 136.1     | 9.5  | 8.6  | 35.7  | 5.9   | 22.3  | 14.8  |
|         | 75         |           | 26.8      | 7.3  | 8.5  | 11.9  | 5.8   | 9.2   | 15.4  |
|         | 100        |           | 18.8      | 8.6  | 8.8  | 10.8  | 7.0   | 9.1   | 27.5  |
| 3       | 75         | Yes       | 70.5      | 8.7  | 9.0  | 21.6  | 5.6   | 14.4  | 29.3  |
|         | 100        | Yes       | 19.7      | 8.8  | 10.0 | 11.4  | 7.8   | 9.8   | 38.6  |
|         | 25         |           | 107.7     | 15.3 | 14.0 | 34.4  | 12.8  | 24.7  | 39.8  |
|         | 50         |           | 90.8      | 18.6 | 18.5 | 33.5  | 14.3  | 24.9  | 41.3  |
|         | 75         |           | 51.2      | 16.3 | 16.9 | 24.0  | 14.5  | 19.7  | 36.7  |
| 4       | 100        |           | 29.4      | 16.1 | 17.2 | 19.2  | 15.3  | 17.4  | 36.6  |
|         | 75         | Yes       | 53.3      | 18.3 | 21.1 | 26.4  | 20.6  | 23.8  | 39.2  |
|         | 100        | Yes       | 31.4      | 17.9 | 23.0 | 22.1  | 22.6  | 22.3  | 47.2  |
|         | 25         |           | 171.1     | 12.1 | 11.9 | 44.9  | 6.6   | 27.7  | 28.0  |
|         | 50         |           | 94.3      | 10.4 | 11.1 | 27.9  | 7.4   | 18.7  | 25.2  |
| 5       | 75         |           | 45.3      | 10.3 | 12.4 | 18.4  | 9.3   | 14.3  | 32.6  |
|         | 100        |           | 21.5      | 13.4 | 18.3 | 16.6  | 14.6  | 15.7  | 69.3  |
|         | 75         | Yes       | 44.0      | 10.6 | 14.3 | 18.5  | 10.3  | 14.3  | 51.8  |
|         | 100        | Yes       | 20.1      | 15.9 | 26.3 | 19.6  | 17.6  | 13.7  | 91.0  |
|         | 25         |           | 59.5      | 14.0 | 13.5 | 23.3  | 5.7   | 15.4  | 29.1  |
|         | 50         |           | 30.6      | 8.1  | 10.3 | 13.5  | 4.8   | 9.6   | 24.0  |
|         | 75         |           | 29.3      | 11.1 | 20.1 | 17.3  | 10.5  | 14.2  | 44.9  |
|         | 100        |           | 25.3      | 13.2 | 27.7 | 19.7  | 17.9  | 18.9  | 64.3  |
|         | 75         | Yes       | 31.9      | 11.3 | 20.6 | 13.1  | 14.0  | 16.3  | 69.9  |
|         | 100        | Yes       | 31.1      | 23.4 | 46.8 | 34.0  | 37.6  | 35.6  | 134.3 |

# APPENDIX C

TABLE C-1. - CO emissions, gpm - baseline vehicles (1970 MY)--Continued

| Car No. | Temp., ° F | Air cond. | Urban FTP |      |      |       | 55/45 |       | NYCC |
|---------|------------|-----------|-----------|------|------|-------|-------|-------|------|
|         |            |           | CT        | ST   | HT   | Urban | HFET  | Comp. |      |
| 6       | 25         |           | 207.1     | 15.5 | 10.9 | 54.1  | 7.4   | 33.1  | 23.6 |
|         | 50         |           | 38.2      | 10.1 | 10.2 | 15.3  | 6.7   | 11.7  | 19.6 |
|         | 75         |           | 18.3      | 10.5 | 9.0  | 11.7  | 6.5   | 9.4   | 22.1 |
|         | 100        |           | 12.7      | 8.9  | 7.7  | 9.4   | 8.3   | 8.9   | 27.7 |
|         | 75         | Yes       | 21.5      | 11.6 | 10.3 | 13.3  | 6.1   | 10.1  | 26.5 |
| 7       | 100        | Yes       | 13.6      | 8.7  | 9.0  | 9.8   | 5.7   | 8.0   | 27.9 |
|         | 25         |           | 45.3      | 4.6  | 9.1  | 14.3  | 6.0   | 10.6  | 8.9  |
|         | 50         |           | 26.7      | 4.9  | 11.2 | 11.1  | 9.6   | 10.4  | 10.1 |
|         | 75         |           | 19.2      | 8.5  | 15.9 | 12.7  | 11.3  | 12.1  | 16.3 |
|         | 100        |           | 17.3      | 9.3  | 29.4 | 16.5  | 26.0  | 20.8  | 43.8 |
| 8       | 25         |           | 32.7      | 39.3 | 46.8 | 50.3  | 13.6  | 36.0  | 61.3 |
|         | 50         |           | 72.6      | 21.2 | 24.2 | 32.7  | 10.4  | 22.7  | 33.3 |
|         | 75         |           | 42.7      | 18.6 | 15.4 | 22.7  | 14.5  | 19.0  | 23.2 |
|         | 100        |           | 34.5      | 13.9 | 22.5 | 23.1  | 18.8  | 21.2  | 42.5 |
|         | 75         | Yes       | 44.5      | 23.0 | 22.0 | 27.2  | 17.0  | 22.6  | 42.8 |
| 9       | 100        | Yes       | 28.3      | 19.7 | 26.5 | 23.3  | 25.5  | 24.3  | 70.6 |
|         | 25         |           | 108.7     | 19.6 | 16.3 | 39.0  | 13.2  | 27.4  | 25.2 |
|         | 50         |           | 33.3      | 22.1 | 25.6 | 36.5  | 15.3  | 27.0  | 30.7 |
|         | 75         |           | 69.3      | 17.5 | 22.4 | 29.7  | 15.3  | 23.2  | 21.0 |
|         | 100        |           | 31.7      | 14.6 | 18.0 | 19.0  | 14.3  | 16.9  | 23.9 |
| 10      | 75         | Yes       | 64.3      | 17.5 | 17.9 | 27.3  | 15.9  | 22.2  | 33.3 |
|         | 100        | Yes       | 41.4      | 13.0 | 21.5 | 21.2  | 13.2  | 17.6  | 27.3 |
|         | 25         |           | 165.8     | 17.0 | 3.2  | 45.6  | 4.5   | 27.1  | 12.6 |
|         | 50         |           | 62.6      | 17.9 | 10.1 | 25.0  | 5.3   | 16.1  | 13.9 |
|         | 75         |           | 16.0      | 11.4 | 9.2  | 11.7  | 6.1   | 9.2   | 15.5 |
|         | 100        |           | 9.6       | 10.4 | 9.5  | 10.0  | 7.1   | 3.7   | 23.3 |

# APPENDIX C

TABLE C-1. - CO emissions, gpm - baseline vehicles (1970 MY) --Continued

| Car No. | Temp., ° F | Air cond. | Urban FTP |      |      | 55/45 |      | NYCC |       |
|---------|------------|-----------|-----------|------|------|-------|------|------|-------|
|         |            |           | CT        | ST   | HT   | Urban | HFET |      | Comp. |
| 11      | 25         |           | 182.5     | 11.0 | 20.6 | 49.4  | 4.5  | 29.2 | 15.7  |
|         | 50         |           | 163.4     | 8.2  | 20.7 | 43.3  | 4.7  | 25.9 | 20.5  |
|         | 75         |           | 120.5     | 9.3  | 18.7 | 34.8  | 3.8  | 20.9 | 23.6  |
|         | 100        |           | 80.8      | 7.9  | 18.2 | 25.8  | 4.3  | 16.1 | 35.0  |
| 12      | 25         |           | 175.8     | 8.3  | 11.0 | 43.6  | 5.2  | 26.3 | 17.1  |
|         | 50         |           | 75.1      | 8.7  | 9.4  | 22.6  | 6.6  | 15.4 | 22.9  |
|         | 75         |           | 20.8      | 7.7  | 10.9 | 11.2  | 5.5  | 8.6  | 19.8  |
|         | 100        |           | 17.6      | 9.2  | 11.0 | 11.4  | 8.8  | 10.2 | 36.8  |
|         | 75         | Yes       | 26.7      | 9.4  | 15.2 | 14.5  | 6.7  | 11.0 | 28.8  |
|         | 100        | Yes       | 33.8      | 19.1 | 26.4 | 24.1  | 16.7 | 20.3 | 72.0  |
| 13      | 25         |           | 124.5     | 43.5 | 37.0 | 60.9  | 26.9 | 45.6 | 36.0  |
|         | 50         |           | 86.7      | 32.0 | 30.5 | 42.9  | 29.6 | 36.9 | 35.1  |
|         | 75         |           | 68.3      | 31.7 | 29.5 | 38.6  | 31.5 | 35.4 | 29.6  |
|         | 100        |           | 40.7      | 19.3 | 25.7 | 25.7  | 30.2 | 27.7 | 27.9  |
|         | 75         | Yes       | 77.5      | 34.4 | 26.7 | 41.2  | 29.9 | 36.1 | 35.7  |
|         | 100        | Yes       | 40.9      | 23.9 | 36.3 | 33.4  | 35.1 | 34.2 | 116.8 |
| 14      | 25         |           | 114.8     | 12.9 | 10.4 | 33.0  | 3.3  | 19.6 | 20.2  |
|         | 50         |           | 110.1     | 13.1 | 15.5 | 33.5  | 3.9  | 20.2 | 27.7  |
|         | 75         |           | 46.8      | 9.5  | 18.1 | 19.6  | 5.7  | 13.3 | 28.1  |
|         | 100        |           | 36.2      | 12.5 | 22.3 | 20.0  | 3.5  | 14.3 | 29.4  |
| 15      | 25         |           | 45.2      | 3.5  | 3.9  | 12.2  | 3.6  | 8.3  | 6.8   |
|         | 50         |           | 16.2      | 3.4  | 3.3  | 6.2   | 3.5  | 5.0  | 6.4   |
|         | 75         |           | 16.2      | 3.4  | 4.3  | 6.3   | 3.7  | 5.1  | 3.3   |
|         | 100        |           | 5.3       | 3.2  | 4.1  | 3.9   | 3.2  | 3.6  | 10.4  |
|         | 75         | Yes       | 12.4      | 3.6  | 4.3  | 5.6   | 3.7  | 4.7  | 11.2  |
|         | 100        | Yes       | 5.4       | 3.6  | 4.7  | 4.2   | 3.3  | 4.0  | 14.0  |

# APPENDIX C

TABLE C-1. - CO emissions, gpm - baseline vehicles (1970 MY)--Continued

| Car No. | Temp., ° F | Air cond. | Urban FTP |      |      | Urban | HFET | 55/45 |      | NYCC |
|---------|------------|-----------|-----------|------|------|-------|------|-------|------|------|
|         |            |           | CT        | ST   | HT   |       |      | Comp. |      |      |
| 16      | 25         |           | 133.2     | 13.4 | 11.9 | 37.9  | 5.1  | 23.1  | 20.2 |      |
|         | 50         |           | 103.7     | 11.6 | 11.2 | 31.4  | 5.0  | 19.5  | 18.7 |      |
|         | 75         |           | 67.0      | 11.2 | 10.1 | 22.5  | 6.4  | 15.3  | 23.7 |      |
|         | 100        |           | 30.0      | 13.7 | 17.0 | 13.0  | 9.4  | 14.1  | 25.6 |      |
|         | 75         | Yes       | 61.6      | 13.3 | 12.1 | 23.0  | 6.8  | 15.7  | 27.4 |      |
| 100     | Yes        | 41.3      | 17.2      | 15.1 | 21.7 | 10.5  | 16.7 | 40.5  |      |      |
| 17      | 25         |           | 170.7     | 9.7  | 6.9  | 42.0  | 4.1  | 24.9  | 11.8 |      |
|         | 50         |           | 117.0     | 8.4  | 6.4  | 30.3  | 5.2  | 19.0  | 14.1 |      |
|         | 75         |           | 71.8      | 8.5  | 8.8  | 21.6  | 5.3  | 14.3  | 16.7 |      |
|         | 100        |           | 16.2      | 6.4  | 9.6  | 9.3   | 5.7  | 7.7   | 17.3 |      |
|         |            |           |           |      |      |       |      |       |      |      |
| 18      | 25         |           | 95.6      | 30.4 | 16.3 | 39.8  | 17.4 | 29.7  | 65.4 |      |
|         | 50         |           | 77.8      | 22.9 | 33.2 | 37.1  | 25.6 | 31.9  | 43.4 |      |
|         | 75         |           | 63.4      | 22.6 | 36.3 | 34.9  | 25.5 | 30.7  | 55.0 |      |
|         | 100        |           | 52.4      | 19.3 | 36.3 | 31.0  | 25.8 | 23.7  | 58.9 |      |
|         |            |           |           |      |      |       |      |       |      |      |
| 19      | 25         |           | 39.1      | 12.0 | 7.3  | 16.3  | 3.4  | 10.5  | 18.9 |      |
|         | 50         |           | 45.4      | 16.0 | 18.0 | 22.6  | 3.8  | 14.1  | 29.1 |      |
|         | 75         |           | 19.5      | 14.2 | 10.3 | 14.2  | 3.5  | 9.4   | 13.8 |      |
|         | 100        |           | 11.6      | 8.0  | 12.4 | 9.9   | 3.7  | 7.1   | 19.6 |      |
|         |            |           |           |      |      |       |      |       |      |      |
| 20      | 25         |           | 120.6     | 56.3 | 43.2 | 67.7  | 10.5 | 42.0  | 96.8 |      |
|         | 50         |           | 101.1     | 55.6 | 53.2 | 65.7  | 11.4 | 41.3  | 79.2 |      |
|         | 75         |           | 64.4      | 43.7 | 37.3 | 46.2  | 9.3  | 29.3  | 57.7 |      |
|         | 100        |           | 46.7      | 20.5 | 40.4 | 31.4  | 10.5 | 22.0  | 85.5 |      |
|         | 75         | Yes       | 76.0      | 35.8 | 51.4 | 49.4  | 13.6 | 32.7  | 78.5 |      |
| 100     | Yes        | 72.5      | 30.3      | 55.8 | 45.9 | 20.4  | 34.7 | 104.1 |      |      |

# APPENDIX C

TABLE C-1. - CO emissions, gpm - baseline vehicles (1970 MY)--Continued

| Car No. | Temp., ° F | Air cond. | Urban Frrp |      |      |       | HFET | 55/45 |       | NVCC |
|---------|------------|-----------|------------|------|------|-------|------|-------|-------|------|
|         |            |           | CT         | ST   | HT   | Urban |      | Comp. |       |      |
| 21      | 25         |           | 55.5       | 7.3  | 10.1 | 19.2  | 3.2  | 11.5  | 13.5  |      |
|         | 50         |           | 46.8       | 10.5 | 15.6 | 19.4  | 3.6  | 12.3  | 21.6  |      |
|         | 75         |           | 10.5       | 4.6  | 5.6  | 6.1   | 3.0  | 4.7   | 11.3  |      |
|         | 100        |           | 21.4       | 10.8 | 13.2 | 13.7  | 2.8  | 9.8   | 30.8  |      |
| 22      | 25         |           | 61.5       | 4.6  | 10.2 | 17.9  | 2.7  | 11.1  | 10.3  |      |
|         | 50         |           | 32.7       | 6.5  | 8.2  | 12.4  | 3.1  | 8.2   | 14.4  |      |
|         | 75         |           | 19.0       | 14.4 | 6.7  | 13.2  | 3.6  | 3.9   | 16.2  |      |
|         | 100        |           | 11.0       | 9.8  | 9.5  | 10.0  | 4.1  | 7.3   | 16.9  |      |
| 23      | 25         |           | 107.6      | 35.5 | 31.6 | 49.3  | 34.5 | 42.6  | 61.6  |      |
|         | 50         |           | 87.6       | 33.8 | 34.6 | 45.3  | 33.9 | 40.2  | 71.0  |      |
|         | 75         |           | 75.4       | 40.6 | 44.5 | 48.9  | 40.2 | 45.0  | 101.3 |      |
|         | 100        |           | 51.3       | 42.0 | 41.8 | 43.9  | 31.6 | 38.4  | 97.0  |      |
|         | 75         | Yes       | 30.0       | 41.5 | 49.5 | 51.6  | 32.8 | 43.1  | 93.9  |      |
|         | 100        | Yes       | 49.3       | 46.3 | 57.8 | 50.3  | 37.4 | 44.5  | 127.2 |      |
|         |            |           |            |      |      |       |      |       |       |      |
| 24      | 25         |           | 59.1       | 18.3 | 16.9 | 26.2  | 4.9  | 16.6  | 37.6  |      |
|         | 50         |           | 38.6       | 18.4 | 13.3 | 21.2  | 4.1  | 13.5  | 45.1  |      |
|         | 75         |           | 27.2       | 17.6 | 12.8 | 18.3  | 3.9  | 11.3  | 47.8  |      |
|         | 100        |           | 21.1       | 23.2 | 17.7 | 21.3  | 6.7  | 14.7  | 71.0  |      |
| 25      | 25         |           | 125.8      | 9.4  | 7.6  | 32.8  | 3.1  | 19.4  | 12.0  |      |
|         | 50         |           | 104.4      | 7.3  | 6.7  | 27.6  | 3.2  | 16.6  | 13.7  |      |
|         | 75         |           | 71.4       | 5.9  | 7.4  | 19.9  | 3.2  | 12.4  | 9.5   |      |
|         | 100        |           | 47.1       | 4.1  | 5.1  | 13.3  | 3.0  | 8.7   | 12.9  |      |

# APPENDIX C

TABLE C-1. - CO emissions, gpm - baseline vehicles (1970 MY) --Continued

| Car No. | Temp., ° F | Air cond. | Urban FTP |      |      | Urban | HFET | 55/45 |       |
|---------|------------|-----------|-----------|------|------|-------|------|-------|-------|
|         |            |           | CT        | ST   | HT   |       |      | Comp. | NYCC  |
| 26      | 25         |           | 191.8     | 33.2 | 40.1 | 67.6  | 18.4 | 45.5  | 40.7  |
|         | 50         |           | 124.0     | 25.7 | 19.3 | 44.4  | 15.9 | 31.5  | 47.9  |
|         | 75         |           | 70.1      | 29.3 | 21.8 | 35.7  | 18.4 | 27.9  | 39.6  |
|         | 100        |           | 35.4      | 23.9 | 30.8 | 28.2  | 31.8 | 29.8  | 51.8  |
|         | 75         | Yes       | 63.7      | 31.0 | 22.5 | 35.4  | 20.6 | 28.7  | 43.2  |
| 27      | 100        | Yes       | 41.1      | 36.7 | 35.7 | 37.4  | 41.6 | 39.3  | 82.6  |
|         | 25         |           | 248.9     | 18.2 | 7.9  | 65.9  | 4.0  | 38.1  | 11.7  |
|         | 50         |           | 115.2     | 16.8 | 4.0  | 33.5  | 2.8  | 19.7  | 6.9   |
|         | 75         |           | 39.4      | 12.8 | 7.4  | 16.8  | 3.9  | 11.0  | 16.5  |
|         | 100        |           | 33.2      | 12.8 | 7.6  | 15.6  | 4.0  | 10.4  | 53.7  |
| 28      | 75         | Yes       | 65.1      | 6.3  | 5.6  | 13.1  | 3.2  | 11.4  | 16.0  |
|         | 100        | Yes       | 29.1      | 8.2  | 8.9  | 12.7  | 6.3  | 9.3   | 110.4 |
|         | 25         |           | 206.6     | 48.8 | 34.3 | 77.3  | 23.5 | 53.1  | 76.7  |
|         | 50         |           | 164.2     | 21.7 | 18.3 | 50.4  | 8.6  | 31.6  | 42.1  |
|         | 75         |           | 111.3     | 17.7 | 15.3 | 36.3  | 9.9  | 24.4  | 30.9  |
| 29      | 100        |           | 61.0      | 14.1 | 15.2 | 24.1  | 10.3 | 17.9  | 52.3  |
|         | 25         |           | 74.9      | 26.4 | 13.4 | 34.6  | 9.0  | 23.1  | 53.9  |
|         | 50         |           | 73.1      | 34.1 | 27.4 | 40.4  | 8.2  | 25.9  | 71.9  |
|         | 75         |           | 48.4      | 31.0 | 19.3 | 31.5  | 6.7  | 20.3  | 58.3  |
|         | 100        |           | 44.5      | 38.2 | 24.9 | 35.8  | 12.2 | 25.2  | 104.0 |
| 30      | 25         |           | 126.5     | 10.6 | 13.8 | 35.2  | 5.0  | 21.6  | 19.9  |
|         | 50         |           | 90.0      | 11.5 | 16.0 | 29.0  | 5.3  | 13.6  | 47.6  |
|         | 75         |           | 51.5      | 13.2 | 13.2 | 21.0  | 6.5  | 14.5  | 49.2  |
|         | 100        |           | 29.8      | 15.6 | 21.3 | 20.1  | 12.0 | 16.4  | 124.5 |
|         | 75         | Yes       | 90.5      | 9.4  | 19.0 | 28.5  | 6.9  | 13.8  | 51.6  |
| 30      | 100        | Yes       | 21.5      | 22.8 | 34.0 | 25.6  | 12.5 | 19.7  | 169.4 |

# APPENDIX C

TABLE C-2. - CO emissions, gpm. - production late model

| Car No. | Temp., ° F | Air cond. | Urban FTP |     |      |       | 55/45 |       | NYCC  |
|---------|------------|-----------|-----------|-----|------|-------|-------|-------|-------|
|         |            |           | CT        | ST  | HT   | Urban | HFET  | Comp. |       |
| 1       | 25         |           | 23.0      | 1.0 | 3.6  | 6.2   | 0.1   | 3.4   | 0.7   |
|         | 50         |           | 17.6      | 0.7 | 2.3  | 4.6   | 0.1   | 2.6   | 1.5   |
|         | 75         |           | 10.5      | 0.3 | 0.7  | 2.5   | 0.1   | 1.4   | 0.5   |
|         | 100        |           | 11.0      | 0.9 | 2.6  | 3.4   | 0.1   | 1.9   | 3.7   |
|         | 75         | Yes       | 14.0      | 0.5 | 1.7  | 3.6   | 0.1   | 2.0   | 0.9   |
| 2       | 100        | Yes       | 13.2      | 1.5 | 2.8  | 4.3   | 0.2   | 2.4   | 5.7   |
|         | 25         |           | 210.2     | 6.2 | 8.0  | 49.0  | 0.8   | 27.3  | 7.2   |
|         | 50         |           | 132.9     | 2.7 | 3.9  | 30.0  | 0.7   | 16.3  | 3.3   |
|         | 75         |           | 49.3      | 1.3 | 3.0  | 11.7  | 0.6   | 6.7   | 3.3   |
|         | 100        |           | 33.8      | 1.4 | 9.1  | 10.2  | 1.4   | 6.3   | 58.6  |
| 3       | 75         | Yes       | 45.4      | 1.6 | 4.6  | 11.4  | 0.8   | 6.7   | 7.2   |
|         | 100        | Yes       | 31.7      | 2.3 | 20.6 | 13.4  | 16.9  | 15.0  | 123.9 |
|         | 25         |           | 135.4     | 2.7 | 4.2  | 30.5  | 0.2   | 16.9  | 5.5   |
|         | 50         |           | 68.3      | 2.1 | 3.4  | 16.2  | 0.2   | 9.0   | 8.0   |
|         | 75         |           | 19.4      | 1.2 | 6.5  | 6.3   | 0.2   | 3.6   | 12.3  |
| 4       | 100        |           | 14.8      | 1.3 | 6.2  | 5.4   | 0.2   | 3.1   | 29.1  |
|         | 75         | Yes       | 19.7      | 1.4 | 5.7  | 6.3   | 0.2   | 3.6   | 24.1  |
|         | 100        | Yes       | 24.9      | 3.2 | 7.6  | 8.9   | 0.6   | 5.2   | 35.0  |
|         | 25         |           | 47.2      | 6.5 | 8.5  | 15.4  | 4.8   | 10.6  | 11.8  |
|         | 50         |           | 37.7      | 6.2 | 16.6 | 15.6  | 2.3   | 9.6   | 16.3  |
|         | 75         |           | 15.5      | 4.9 | 10.2 | 8.6   | 1.7   | 5.5   | 10.7  |
|         | 100        |           | 16.1      | 9.1 | 12.5 | 11.5  | 3.2   | 7.7   | 34.9  |
|         | 75         | Yes       | 17.1      | 3.7 | 10.9 | 8.4   | 1.7   | 5.4   | 10.8  |
|         | 100        | Yes       | 24.1      | 9.3 | 20.5 | 15.4  | 5.7   | 11.0  | 53.9  |

# APPENDIX C

TABLE C-2. - CO emissions, gpm - production late model--Continued

| Car No. | Temp., ° F | Air cond. | Urban FTP |     |     |       | 55/45 |       | NYCC |
|---------|------------|-----------|-----------|-----|-----|-------|-------|-------|------|
|         |            |           | CT        | ST  | HT  | Urban | HFET  | Comp. |      |
| 5       | 25         |           | 2.2       | 1.6 | 1.3 | 1.6   | 0.7   | 1.2   | 3.6  |
|         | 50         |           | 1.8       | 1.6 | 1.3 | 1.5   | 0.7   | 1.2   | 3.6  |
|         | 75         |           | 1.9       | 1.7 | 1.4 | 1.6   | 0.7   | 1.2   | 3.9  |
|         | 100        |           | 1.8       | 1.7 | 1.4 | 1.6   | 0.7   | 1.2   | 4.0  |
|         | 75         | Yes       | 1.9       | 1.7 | 1.6 | 1.7   | 0.8   | 1.3   | 3.7  |
| 6       | 100        | Yes       | 2.3       | 2.0 | 1.7 | 2.0   | 0.9   | 1.5   | 4.2  |
|         | 25         |           | 44.5      | 6.3 | 6.4 | 14.4  | 1.7   | 8.7   | 27.6 |
|         | 50         |           | 17.3      | 3.1 | 1.8 | 5.6   | 0.7   | 3.4   | 20.6 |
|         | 75         |           | 7.4       | 3.7 | 1.5 | 3.9   | 0.6   | 2.4   | 2.4  |
|         | 100        |           | 5.1       | 1.7 | 1.9 | 2.5   | 0.6   | 1.6   | 5.8  |
| 7       | 75         | Yes       | 9.2       | 4.1 | 3.2 | 4.9   | 0.6   | 3.0   | 14.3 |
|         | 100        | Yes       | 5.0       | 1.0 | 2.9 | 2.3   | 0.9   | 1.7   | 6.1  |
|         | 25         |           | 1.5       | 1.3 | 1.1 | 1.3   | 0.9   | 1.1   | 1.7  |
|         | 50         |           | 1.2       | 1.2 | 0.9 | 1.1   | 0.6   | 0.9   | 1.7  |
|         | 75         |           | 1.0       | 1.0 | 0.8 | 0.9   | 0.6   | 0.8   | 1.7  |
|         | 100        |           | 1.1       | 1.1 | 1.1 | 1.1   | 0.8   | 1.0   | 1.9  |
|         | 75         | Yes       | 1.2       | 1.1 | 1.0 | 1.1   | 0.7   | 0.9   | 2.1  |
|         | 100        | Yes       | 1.3       | 1.1 | 1.2 | 1.2   | 0.9   | 1.0   | 2.0  |

APPENDIX D. - NO<sub>x</sub> EMISSIONS, GPM

# APPENDIX D

TABLE D-1. - NO<sub>x</sub> emissions, gpm - baseline vehicles (1970 MY)

| Car No. | Temp., ° F | Air cond. | Urban FTP |      |       |       | Urban | HFET | 55/45 |  | NYCC |
|---------|------------|-----------|-----------|------|-------|-------|-------|------|-------|--|------|
|         |            |           | CT        | ST   | HT    | Comp. |       |      |       |  |      |
| 1       | 25         |           | 3.81      | 4.43 | 6.03  | 4.76  | 5.81  | 5.23 | 6.04  |  |      |
|         | 50         |           | 4.90      | 4.68 | 6.14  | 5.13  | 5.92  | 5.49 | 6.44  |  |      |
|         | 75         |           | 6.21      | 4.79 | 6.31  | 5.50  | 6.45  | 5.93 | 6.35  |  |      |
|         | 100        |           | 6.81      | 5.50 | 6.42  | 6.02  | 6.46  | 6.22 | 9.36  |  |      |
|         | 75         | Yes       | 6.76      | 5.66 | 7.18  | 6.31  | 7.33  | 6.77 | 7.78  |  |      |
| 2       | 100        | Yes       | 8.74      | 6.73 | 7.96  | 7.49  | 8.36  | 7.98 | 8.38  |  |      |
|         | 25         |           | 4.38      | 3.48 | 6.40  | 4.47  | 6.94  | 5.53 | 4.06  |  |      |
|         | 50         |           | 5.62      | 3.54 | 6.28  | 4.73  | 6.69  | 5.51 | 4.43  |  |      |
|         | 75         |           | 5.79      | 3.42 | 6.54  | 4.78  | 7.00  | 5.78 | 4.52  |  |      |
|         | 100        |           | 6.88      | 3.70 | 7.14  | 5.30  | 8.52  | 6.75 | 5.50  |  |      |
| 3       | 75         | Yes       | 7.47      | 5.31 | 8.60  | 6.66  | 9.72  | 9.04 | 6.81  |  |      |
|         | 100        | Yes       | 8.40      | 5.45 | 9.45  | 7.17  | 12.20 | 9.43 | 11.48 |  |      |
|         | 25         |           | 3.37      | 2.26 | 3.41  | 2.81  | 3.24  | 3.00 | 2.99  |  |      |
|         | 50         |           | 3.42      | 2.45 | 3.29  | 2.88  | 3.49  | 3.15 | 3.58  |  |      |
|         | 75         |           | 3.45      | 2.23 | 3.30  | 2.78  | 3.40  | 3.06 | 3.31  |  |      |
| 4       | 100        |           | 3.42      | 2.27 | 3.38  | 2.81  | 3.68  | 3.20 | 3.68  |  |      |
|         | 75         | Yes       | 4.45      | 3.46 | 4.50  | 3.95  | 4.55  | 4.22 | 5.08  |  |      |
|         | 100        | Yes       | 4.97      | 4.08 | 5.37  | 4.62  | 5.18  | 4.87 | 6.39  |  |      |
|         | 25         |           | 5.04      | 5.79 | 7.54  | 6.11  | 7.02  | 6.52 | 12.57 |  |      |
|         | 50         |           | 5.75      | 4.79 | 8.13  | 5.90  | 7.94  | 6.32 | 8.93  |  |      |
| 5       | 75         |           | 6.69      | 4.96 | 8.20  | 6.21  | 7.73  | 6.89 | 8.69  |  |      |
|         | 100        |           | 7.87      | 5.85 | 7.98  | 6.85  | 3.36  | 7.53 | 10.15 |  |      |
|         | 75         | Yes       | 8.30      | 6.30 | 9.48  | 7.59  | 9.72  | 9.10 | 9.91  |  |      |
|         | 100        | Yes       | 9.49      | 7.40 | 10.30 | 8.76  | 10.58 | 9.53 | 12.53 |  |      |
|         | 25         |           | 6.51      | 5.34 | 6.94  | 6.28  | 6.90  | 6.56 | 6.99  |  |      |
|         | 50         |           | 7.18      | 5.35 | 6.88  | 6.67  | 7.02  | 6.33 | 7.29  |  |      |
|         | 75         |           | 6.41      | 5.33 | 6.51  | 5.89  | 6.43  | 6.13 | 6.96  |  |      |
|         | 100        |           | 6.34      | 5.24 | 6.10  | 5.71  | 5.82  | 5.76 | 5.98  |  |      |
|         | 75         | Yes       | 6.74      | 6.06 | 6.56  | 6.34  | 6.56  | 6.44 | 5.86  |  |      |
|         | 100        | Yes       | 6.94      | 6.10 | 6.08  | 6.27  | 5.80  | 5.06 | 5.86  |  |      |

APPENDIX D

TABLE D-1. - NO<sub>x</sub> emissions, gpm - baseline vehicles (1970 MY)--Continued

| Car No. | Temp., ° F | Air cond. | Urban FTP |      |       |       | 55/45 |       | NYCC  |
|---------|------------|-----------|-----------|------|-------|-------|-------|-------|-------|
|         |            |           | CT        | ST   | HT    | Urban | HFET  | Comp. |       |
| 6       | 25         |           | 4.68      | 2.99 | 5.49  | 4.02  | 5.54  | 4.75  | 3.46  |
|         | 50         |           | 5.19      | 3.22 | 5.92  | 4.36  | 5.63  | 4.95  | 3.97  |
|         | 75         |           | 5.84      | 2.96 | 5.73  | 4.32  | 5.53  | 4.86  | 3.93  |
|         | 100        |           | 6.16      | 3.28 | 6.13  | 4.65  | 5.97  | 5.24  | 4.54  |
|         | 75         | Yes       | 6.65      | 4.24 | 6.96  | 5.49  | 6.51  | 5.95  | 5.41  |
| 7       | 100        | Yes       | 7.70      | 4.95 | 8.71  | 6.55  | 9.11  | 7.70  | 7.17  |
|         | 25         |           | 4.52      | 3.40 | 4.27  | 3.88  | 4.02  | 3.94  | 5.14  |
|         | 50         |           | 4.63      | 3.74 | 4.57  | 4.14  | 4.31  | 4.22  | 4.58  |
|         | 75         |           | 4.55      | 3.54 | 4.57  | 4.03  | 4.15  | 4.08  | 4.30  |
|         | 100        |           | 4.22      | 3.44 | 3.96  | 3.74  | 3.96  | 3.84  | 4.64  |
| 8       | 25         |           | 3.36      | 2.31 | 2.93  | 2.70  | 2.32  | 2.53  | 3.55  |
|         | 50         |           | 3.10      | 2.27 | 2.88  | 2.61  | 2.30  | 2.47  | 3.55  |
|         | 75         |           | 3.24      | 2.22 | 3.86  | 2.60  | 2.21  | 2.42  | 3.47  |
|         | 100        |           | 3.07      | 2.52 | 2.52  | 2.52  | 2.27  | 2.41  | 3.79  |
|         | 75         | Yes       | 4.13      | 3.03 | 3.75  | 3.47  | 3.02  | 3.27  | 4.39  |
| 9       | 100        | Yes       | 4.00      | 3.26 | 3.80  | 3.56  | 3.15  | 3.33  | 5.31  |
|         | 25         |           | 5.22      | 4.57 | 6.32  | 5.30  | 5.67  | 5.47  | 7.09  |
|         | 50         |           | 5.92      | 4.66 | 6.64  | 5.45  | 5.62  | 5.53  | 6.94  |
|         | 75         |           | 5.54      | 4.56 | 6.48  | 5.29  | 5.38  | 5.33  | 6.69  |
|         | 100        |           | 7.14      | 4.90 | 7.42  | 6.05  | 6.20  | 6.12  | 9.14  |
| 10      | 75         | Yes       | 6.25      | 6.61 | 7.75  | 6.85  | 7.55  | 7.17  | 8.49  |
|         | 100        | Yes       | 9.57      | 7.03 | 10.29 | 8.48  | 6.66  | 7.66  | 10.15 |
|         | 25         |           | 5.04      | 6.03 | 8.39  | 6.43  | 7.36  | 6.38  | 9.54  |
|         | 50         |           | 7.93      | 6.29 | 8.73  | 7.30  | 3.22  | 7.71  | 12.40 |
|         | 75         |           | 9.17      | 6.55 | 9.75  | 7.98  | 8.33  | 3.16  | 12.59 |
| 10      | 100        |           | 9.22      | 7.10 | 9.42  | 3.19  | 9.12  | 8.61  | 13.60 |

# APPENDIX D

TABLE D-1. - NO<sub>x</sub> emissions, gpm - baseline vehicles (1970 MY)--Continued

| Car No. | Temp., ° F | Air cond. | Urban FTP |      |       | Urban | 55/45 |       | NYCC  |
|---------|------------|-----------|-----------|------|-------|-------|-------|-------|-------|
|         |            |           | CT        | ST   | HT    |       | HFET  | Comp. |       |
| 11      | 25         |           | 2.74      | 2.42 | 3.12  | 2.68  | 2.50  | 2.60  | 4.35  |
|         | 50         |           | 2.84      | 2.80 | 3.23  | 2.92  | 2.65  | 2.30  | 3.50  |
|         | 75         |           | 2.38      | 2.13 | 2.79  | 2.36  | 2.40  | 2.38  | 3.63  |
|         | 100        |           | 2.80      | 2.44 | 3.06  | 2.68  | 2.36  | 2.76  | 3.76  |
| 12      | 25         |           | 5.34      | 4.95 | 9.18  | 6.30  | 8.37  | 7.23  | 6.74  |
|         | 50         |           | 5.30      | 4.23 | 6.92  | 5.29  | 8.27  | 6.63  | 5.27  |
|         | 75         |           | 6.38      | 4.07 | 6.84  | 5.40  | 6.79  | 6.03  | 6.07  |
|         | 100        |           | 7.70      | 4.78 | 9.03  | 6.28  | 8.92  | 7.47  | 6.61  |
|         | 75         | Yes       | 9.94      | 6.91 | 9.92  | 8.36  | 10.56 | 9.35  | 6.94  |
|         | 100        | Yes       | 10.36     | 3.39 | 13.61 | 10.23 | 14.38 | 12.10 | 17.72 |
| 13      | 25         |           | 5.02      | 3.58 | 5.49  | 4.40  | 4.74  | 4.55  | 7.90  |
|         | 50         |           | 4.99      | 3.63 | 5.79  | 4.50  | 4.76  | 4.62  | 7.77  |
|         | 75         |           | 4.53      | 3.30 | 5.33  | 4.11  | 4.45  | 4.26  | 6.34  |
|         | 100        |           | 6.24      | 4.62 | 7.03  | 5.61  | 5.34  | 5.94  | 8.72  |
|         | 75         | Yes       | 5.89      | 5.21 | 6.13  | 5.60  | 6.32  | 6.15  | 9.97  |
|         | 100        | Yes       | 8.53      | 3.10 | 10.18 | 8.77  | 8.83  | 3.30  | 17.78 |
| 14      | 25         |           | 2.74      | 3.40 | 4.53  | 3.58  | 4.63  | 4.05  | 4.58  |
|         | 50         |           | 3.17      | 3.33 | 4.30  | 3.59  | 4.56  | 4.03  | 5.32  |
|         | 75         |           | 4.00      | 3.62 | 4.52  | 3.94  | 5.01  | 4.42  | 7.15  |
|         | 100        |           | 4.20      | 3.54 | 4.46  | 3.92  | 5.06  | 4.43  | 6.72  |
| 15      | 25         |           | 5.49      | 2.90 | 4.62  | 3.90  | 3.45  | 3.70  | 4.30  |
|         | 50         |           | 5.24      | 2.65 | 4.01  | 3.56  | 3.34  | 3.46  | 4.78  |
|         | 75         |           | 5.28      | 2.95 | 4.52  | 3.86  | 4.86  | 4.31  | 4.70  |
|         | 100        |           | 5.96      | 3.63 | 5.44  | 4.60  | 6.15  | 5.30  | 6.64  |
|         | 75         | Yes       | 6.41      | 3.97 | 5.68  | 4.94  | 5.33  | 5.12  | 6.59  |
|         | 100        | Yes       | 7.49      | 5.60 | 7.52  | 6.51  | 7.75  | 7.07  | 8.69  |

## APPENDIX D

TABLE D-1. - NO<sub>x</sub> emissions, gpm - baseline vehicles (1970 MY)--Continued

| Car No. | Temp., ° F | Air cond. | Urban FTP |      |       | Urban | HFET  | 55/45 |      | NYCC |
|---------|------------|-----------|-----------|------|-------|-------|-------|-------|------|------|
|         |            |           | CT        | ST   | HT    |       |       | Comp. |      |      |
| 16      | 25         |           | 2.21      | 2.06 | 3.16  | 2.40  | 2.42  | 2.41  | 3.60 |      |
|         | 50         |           | 2.92      | 2.32 | 3.77  | 2.84  | 2.86  | 2.85  | 4.16 |      |
|         | 75         |           | 3.15      | 2.08 | 3.24  | 2.62  | 2.75  | 2.68  | 3.65 |      |
|         | 100        |           | 2.83      | 1.90 | 3.14  | 2.43  | 2.52  | 2.47  | 3.73 |      |
|         | 75         | Yes       | 3.90      | 2.73 | 4.31  | 3.41  | 3.30  | 3.36  | 5.29 |      |
| 17      | 100        | Yes       | 4.79      | 3.44 | 5.10  | 4.17  | 4.26  | 4.21  | 6.22 |      |
|         | 25         |           | 3.24      | 3.50 | 6.38  | 4.24  | 5.73  | 4.91  | 6.60 |      |
|         | 50         |           | 4.30      | 3.60 | 6.92  | 4.66  | 6.06  | 5.29  | 6.98 |      |
|         | 75         |           | 5.03      | 3.96 | 7.10  | 5.05  | 6.48  | 5.69  | 6.43 |      |
|         | 100        |           | 7.19      | 4.34 | 8.05  | 5.94  | 7.13  | 6.50  | 7.74 |      |
| 18      | 25         |           | 2.76      | 1.50 | 2.79  | 2.12  | 2.63  | 2.37  | 2.20 |      |
|         | 50         |           | 2.49      | 1.50 | 2.21  | 1.90  | 2.81  | 2.31  | 2.61 |      |
|         | 75         |           | 2.84      | 1.70 | 2.75  | 2.22  | 2.99  | 2.57  | 3.05 |      |
|         | 100        |           | 2.60      | 1.80 | 3.02  | 2.30  | 3.27  | 2.74  | 3.04 |      |
| 19      | 25         |           | 8.14      | 4.47 | 8.06  | 6.22  | 8.46  | 7.23  | 6.01 |      |
|         | 50         |           | 7.84      | 4.52 | 8.43  | 6.27  | 8.74  | 7.38  | 6.78 |      |
|         | 75         |           | 9.37      | 4.97 | 8.95  | 6.97  | 9.14  | 7.95  | 6.53 |      |
|         | 100        |           | 9.63      | 5.31 | 10.20 | 7.54  | 10.13 | 8.71  | 7.78 |      |
| 20      | 25         |           | 6.14      | 4.43 | 5.57  | 5.10  | 5.92  | 5.47  | 6.38 |      |
|         | 50         |           | 5.67      | 4.37 | 6.23  | 5.41  | 5.91  | 5.64  | 7.11 |      |
|         | 75         |           | 6.37      | 4.98 | 6.55  | 5.70  | 6.47  | 6.05  | 7.69 |      |
|         | 100        |           | 5.50      | 4.47 | 5.56  | 4.98  | 6.20  | 5.53  | 6.33 |      |
|         | 75         | Yes       | 5.77      | 5.37 | 5.89  | 5.60  | 6.72  | 6.10  | 6.46 |      |
|         | 100        | Yes       | 5.96      | 5.89 | 6.50  | 6.10  | 7.64  | 6.79  | 7.06 |      |

# APPENDIX D

TABLE D-1. - NO<sub>x</sub> emissions, gpm - baseline vehicles (1970 MY)--Continued

| Car No. | Temp., ° F | Air cond. | Urban FTP |      |      |       | HFET | 55/45 |      |
|---------|------------|-----------|-----------|------|------|-------|------|-------|------|
|         |            |           | CT        | ST   | HT   | Urban |      | Comp. | NYCC |
| 21      | 25         |           | 3.04      | 2.22 | 3.18 | 2.66  | 2.98 | 2.80  | 3.56 |
|         | 50         |           | 3.24      | 2.13 | 3.05 | 2.61  | 3.43 | 2.98  | 3.66 |
|         | 75         |           | 3.75      | 2.23 | 3.36 | 2.86  | 3.40 | 3.10  | 3.85 |
|         | 100        |           | 3.20      | 2.36 | 3.12 | 2.74  | 3.85 | 3.24  | 4.08 |
| 22      | 25         |           | 3.64      | 2.81 | 4.06 | 3.32  | 3.55 | 3.42  | 4.38 |
|         | 50         |           | 4.34      | 3.06 | 4.47 | 3.72  | 4.16 | 3.92  | 4.05 |
|         | 75         |           | 4.73      | 3.07 | 5.17 | 3.99  | 4.35 | 4.15  | 5.10 |
|         | 100        |           | 4.91      | 3.21 | 4.88 | 4.02  | 4.66 | 4.31  | 5.92 |
| 23      | 25         |           | 4.20      | 2.52 | 3.50 | 3.14  | 2.50 | 2.35  | 4.46 |
|         | 50         |           | 3.93      | 2.39 | 3.34 | 2.97  | 2.44 | 2.73  | 3.69 |
|         | 75         |           | 3.80      | 2.40 | 3.61 | 3.03  | 2.52 | 2.80  | 5.72 |
|         | 100        |           | 3.95      | 2.42 | 3.64 | 3.06  | 2.80 | 2.94  | 4.24 |
|         | 75         | Yes       | 4.61      | 3.51 | 4.64 | 4.05  | 3.80 | 3.94  | 4.68 |
|         | 100        | Yes       | 5.12      | 3.74 | 4.91 | 4.35  | 4.00 | 4.19  | 4.83 |
| 24      | 25         |           | 4.08      | 2.22 | 4.48 | 3.58  | 4.46 | 3.98  | 3.14 |
|         | 50         |           | 4.66      | 2.60 | 4.01 | 3.42  | 3.80 | 3.59  | 3.05 |
|         | 75         |           | 4.82      | 2.68 | 3.92 | 3.47  | 4.37 | 3.38  | 3.79 |
|         | 100        |           | 4.71      | 2.66 | 4.18 | 3.51  | 4.48 | 3.95  | 3.60 |
| 25      | 25         |           | 3.52      | 1.66 | 3.12 | 2.44  | 2.98 | 2.68  | 2.69 |
|         | 50         |           | 3.71      | 1.64 | 3.35 | 2.54  | 3.09 | 2.79  | 3.26 |
|         | 75         |           | 3.43      | 1.65 | 3.55 | 2.54  | 3.18 | 2.83  | 3.24 |
|         | 100        |           | 3.23      | 1.74 | 3.68 | 2.60  | 3.67 | 3.08  | 3.89 |

# APPENDIX D

TABLE D-1. - NO<sub>x</sub> emissions, gpm - baseline vehicles (1970 MY) --Continued

| Car No. | Temp., ° F | Air cond. | Urban FTP |      |      | Urban | H/FET | 55/45 |       |
|---------|------------|-----------|-----------|------|------|-------|-------|-------|-------|
|         |            |           | CT        | ST   | HT   |       |       | Comp. | NYCC  |
| 26      | 25         |           | 3.34      | 3.74 | 5.45 | 4.22  | 5.82  | 4.94  | 4.48  |
|         | 50         |           | 4.65      | 3.28 | 5.10 | 4.07  | 5.36  | 4.65  | 4.17  |
|         | 75         |           | 5.62      | 3.96 | 6.39 | 4.97  | 5.91  | 5.39  | 4.31  |
|         | 100        |           | 5.56      | 3.29 | 5.42 | 4.34  | 4.85  | 4.57  | 4.07  |
|         | 75         | Yes       | 6.07      | 4.20 | 6.33 | 5.17  | 5.99  | 5.54  | 4.90  |
| 27      | 100        | Yes       | 6.46      | 4.46 | 6.41 | 5.41  | 5.67  | 5.53  | 4.88  |
|         | 25         |           | 2.79      | 4.45 | 6.56 | 4.68  | 5.67  | 5.13  | 5.64  |
|         | 50         |           | 4.10      | 3.75 | 5.86 | 4.40  | 5.43  | 4.86  | 6.29  |
|         | 75         |           | 6.71      | 5.51 | 6.51 | 6.03  | 5.94  | 5.99  | 7.41  |
|         | 100        |           | 6.10      | 5.16 | 7.75 | 6.06  | 6.42  | 6.22  | 7.86  |
| 28      | 75         | Yes       | 6.15      | 4.84 | 7.52 | 5.84  | 6.75  | 6.25  | 8.61  |
|         | 100        | Yes       | 6.93      | 5.96 | 8.03 | 6.71  | 7.77  | 7.19  | 11.77 |
|         | 25         |           | 4.28      | 6.22 | 7.98 | 6.30  | 7.22  | 6.71  | 8.48  |
|         | 50         |           | 5.69      | 6.70 | 7.76 | 6.79  | 7.52  | 7.12  | 7.23  |
|         | 75         |           | 7.18      | 6.69 | 7.73 | 7.09  | 7.98  | 7.49  | 7.97  |
| 29      | 100        |           | 8.14      | 7.12 | 9.20 | 7.90  | 9.55  | 8.64  | 8.34  |
|         | 25         |           | 2.78      | 2.06 | 3.97 | 2.72  | 4.26  | 3.41  | 2.83  |
|         | 50         |           | 2.12      | 2.12 | 3.26 | 2.43  | 3.89  | 3.09  | 2.87  |
|         | 75         |           | 3.47      | 2.62 | 3.44 | 3.02  | 4.21  | 3.56  | 3.31  |
|         | 100        |           | 3.19      | 1.72 | 3.56 | 2.54  | 4.16  | 3.27  | 2.52  |
| 30      | 25         |           | 5.36      | 3.67 | 6.05 | 4.77  | 5.60  | 5.14  | 6.62  |
|         | 50         |           | 5.88      | 3.32 | 6.17 | 4.89  | 6.00  | 5.19  | 7.21  |
|         | 75         |           | 6.09      | 4.42 | 7.01 | 5.47  | 6.79  | 6.06  | 7.22  |
|         | 100        |           | 6.32      | 4.65 | 7.04 | 5.64  | 7.14  | 6.32  | 7.05  |
|         | 75         | Yes       | 6.19      | 4.68 | 7.38 | 5.72  | 7.23  | 6.42  | 8.31  |
|         | 100        | Yes       | 6.32      | 4.99 | 6.93 | 5.90  | 7.47  | 6.61  | 6.68  |

# APPENDIX D

TABLE D-2. - NO<sub>x</sub> emissions, gpm - production late model

| Car No. | Temp., ° F | Air cond. | Urban FTP |      |      |       | 55/45 |       | NYCC |
|---------|------------|-----------|-----------|------|------|-------|-------|-------|------|
|         |            |           | CT        | ST   | HT   | Urban | HFET  | Comp. |      |
| 1       | 25         |           | 2.24      | 0.43 | 0.81 | 0.93  | 0.93  | 1.88  |      |
|         | 50         |           | 2.72      | 0.39 | 1.15 | 1.08  | 1.24  | 1.81  |      |
|         | 75         |           | 2.00      | 0.50 | 1.25 | 1.01  | 1.30  | 2.53  |      |
|         | 100        |           | 2.14      | 0.40 | 0.94 | 0.90  | 0.96  | 1.28  |      |
|         | 75         | Yes       | 2.28      | 1.03 | 1.76 | 1.49  | 1.37  | 6.93  |      |
| 2       | 100        | Yes       | 2.34      | 1.56 | 1.81 | 1.79  | 1.45  | 1.44  |      |
|         | 25         |           | 0.57      | 0.58 | 0.55 | 0.57  | 0.68  | 1.00  |      |
|         | 50         |           | 1.02      | 0.77 | 0.77 | 0.82  | 0.78  | 1.71  |      |
|         | 75         |           | 1.80      | 0.77 | 0.92 | 1.03  | 0.70  | 1.66  |      |
|         | 100        |           | 2.08      | 0.76 | 0.68 | 1.01  | 0.62  | 0.70  |      |
| 3       | 75         | Yes       | 1.99      | 0.93 | 0.95 | 1.13  | 0.79  | 1.70  |      |
|         | 100        | Yes       | 2.15      | 0.89 | 0.55 | 1.06  | 0.78  | 1.17  |      |
|         | 25         |           | 3.38      | 4.04 | 4.08 | 3.92  | 1.96  | 2.44  |      |
|         | 50         |           | 3.02      | 1.91 | 1.92 | 2.14  | 2.08  | 2.25  |      |
|         | 75         |           | 1.64      | 1.69 | 1.99 | 1.76  | 1.94  | 2.17  |      |
| 4       | 100        |           | 1.47      | 1.46 | 1.34 | 1.57  | 1.98  | 1.75  |      |
|         | 75         | Yes       | 2.06      | 2.58 | 2.78 | 2.53  | 2.42  | 3.13  |      |
|         | 100        | Yes       | 1.45      | 1.93 | 2.02 | 1.89  | 1.39  | 2.44  |      |
|         | 25         |           | 3.36      | 1.46 | 2.01 | 2.00  | 2.08  | 1.78  |      |
|         | 50         |           | 2.90      | 1.47 | 2.07 | 1.93  | 2.59  | 1.46  |      |
|         | 75         |           | 2.91      | 1.38 | 2.05 | 1.89  | 2.15  | 1.75  |      |
|         | 100        |           | 2.43      | 1.13 | 1.74 | 1.58  | 1.96  | 1.58  |      |
|         | 75         | Yes       | 2.91      | 1.43 | 2.21 | 1.95  | 2.17  | 1.77  |      |
|         | 100        | Yes       | 2.52      | 1.50 | 2.03 | 1.87  | 1.97  | 1.75  |      |

# APPENDIX D

TABLE D-2. - NO<sub>x</sub> emissions, gpm - production late model--Continued

| Car No. | Temp., ° F | Air cond. | Urban FTP |      |      |       | 55/45 |       | NYCC |
|---------|------------|-----------|-----------|------|------|-------|-------|-------|------|
|         |            |           | CT        | ST   | HT   | Urban | HFET  | Comp. |      |
| 5       | 25         |           | 2.20      | 2.28 | 2.01 | 2.19  | 1.30  | 2.01  | 3.72 |
|         | 50         |           | 2.17      | 2.35 | 2.08 | 2.24  | 1.82  | 2.05  | 3.40 |
|         | 75         |           | 2.35      | 2.58 | 2.24 | 2.44  | 1.87  | 2.18  | 2.50 |
|         | 100        |           | 2.10      | 2.12 | 2.05 | 2.10  | 1.79  | 1.96  | 3.40 |
|         | 75         | Yes       | 2.19      | 2.22 | 2.19 | 2.20  | 1.75  | 2.00  | 3.67 |
| 6       | 100        | Yes       | 2.71      | 2.56 | 2.35 | 2.54  | 1.87  | 2.24  | 4.23 |
|         | 25         |           | 0.54      | 0.42 | 0.90 | 0.58  | 0.50  | 0.54  | 1.26 |
|         | 50         |           | 0.60      | 0.33 | 1.47 | 0.96  | 0.73  | 0.38  | 1.97 |
|         | 75         |           | 0.79      | 0.64 | 1.38 | 1.04  | 0.57  | 0.33  | 1.94 |
|         | 100        |           | 1.12      | 0.72 | 1.34 | 0.92  | 0.59  | 0.77  | 1.20 |
| 7       | 75         | Yes       | 1.10      | 1.10 | 1.36 | 1.17  | 0.54  | 0.39  | 1.37 |
|         | 100        | Yes       | 0.95      | 0.62 | 1.03 | 0.80  | 0.39  | 0.62  | 1.48 |
|         | 25         |           | 1.21      | 1.29 | 1.03 | 1.20  | 0.82  | 1.03  | 2.26 |
|         | 50         |           | 1.13      | 1.23 | 1.03 | 1.17  | 0.80  | 1.00  | 2.22 |
|         | 75         |           | 1.07      | 1.33 | 1.06 | 1.20  | 0.93  | 1.03  | 2.64 |
|         | 100        |           | 1.14      | 1.39 | 1.16 | 1.23  | 0.92  | 1.12  | 2.46 |
|         | 75         | Yes       | 1.26      | 1.58 | 1.23 | 1.41  | 0.93  | 1.19  | 2.97 |
|         | 100        | Yes       | 1.47      | 1.96 | 1.49 | 1.73  | 1.06  | 1.43  | 3.43 |

APPENDIX E. - FUEL ECONOMY, MPG

# APPENDIX E

TABLE E-1. - Fuel economy, mpg - baseline vehicles (1970 MY)

| Car No. | Temp., ° F | Air cond. | Urban FTP |      |      | Urban | HFET | 55/45 |      |
|---------|------------|-----------|-----------|------|------|-------|------|-------|------|
|         |            |           | CT        | ST   | HT   |       |      | Comp. | NYCC |
| 1       | 25         |           | 8.2       | 10.5 | 12.6 | 10.4  | 17.9 | 12.8  | 5.6  |
|         | 50         |           | 10.0      | 10.9 | 13.8 | 11.4  | 18.8 | 13.3  | 5.7  |
|         | 75         |           | 11.5      | 11.2 | 14.3 | 12.0  | 19.0 | 14.3  | 5.9  |
|         | 100        |           | 12.7      | 11.2 | 14.2 | 12.2  | 19.2 | 14.6  | 5.5  |
|         | 75         | Yes       | 10.7      | 10.7 | 13.2 | 11.3  | 17.8 | 13.5  | 5.8  |
| 2       | 100        | Yes       | 11.4      | 10.8 | 13.3 | 11.5  | 17.6 | 13.6  | 5.7  |
|         | 25         |           | 8.6       | 12.2 | 14.2 | 11.6  | 19.9 | 14.3  | 7.1  |
|         | 50         |           | 10.0      | 12.6 | 14.5 | 12.4  | 21.2 | 15.2  | 7.0  |
|         | 75         |           | 13.0      | 13.6 | 15.3 | 13.9  | 21.4 | 16.5  | 7.1  |
|         | 100        |           | 13.3      | 13.6 | 15.5 | 14.0  | 20.7 | 16.4  | 6.6  |
| 3       | 75         | Yes       | 11.2      | 12.4 | 13.8 | 12.4  | 19.8 | 14.6  | 6.8  |
|         | 100        | Yes       | 12.5      | 12.0 | 13.3 | 12.6  | 13.1 | 14.5  | 6.3  |
|         | 25         |           | 10.6      | 12.9 | 14.8 | 12.8  | 20.5 | 15.4  | 6.6  |
|         | 50         |           | 11.9      | 13.1 | 16.1 | 13.5  | 20.9 | 16.1  | 6.3  |
|         | 75         |           | 13.3      | 13.4 | 16.6 | 14.1  | 21.3 | 16.7  | 6.9  |
| 4       | 100        |           | 14.6      | 14.0 | 16.9 | 14.8  | 21.7 | 17.3  | 7.0  |
|         | 75         | Yes       | 12.0      | 11.9 | 14.7 | 12.6  | 13.6 | 14.7  | 6.5  |
|         | 100        | Yes       | 13.0      | 12.3 | 14.3 | 13.1  | 18.8 | 15.1  | 6.9  |
|         | 25         |           | 7.9       | 9.9  | 12.7 | 10.2  | 17.9 | 12.6  | 5.2  |
|         | 50         |           | 9.7       | 11.7 | 13.0 | 11.4  | 17.7 | 13.5  | 5.6  |
| 5       | 75         |           | 11.7      | 12.1 | 13.3 | 12.3  | 19.0 | 14.6  | 6.0  |
|         | 100        |           | 12.5      | 11.9 | 13.8 | 12.4  | 13.5 | 14.5  | 5.3  |
|         | 75         | Yes       | 11.0      | 11.6 | 13.0 | 11.7  | 17.6 | 13.7  | 5.7  |
|         | 100        | Yes       | 11.4      | 10.3 | 12.4 | 11.2  | 16.7 | 13.1  | 5.3  |
|         | 25         |           | 11.1      | 13.7 | 15.1 | 13.6  | 20.2 | 16.0  | 7.8  |
|         | 50         |           | 12.3      | 13.3 | 16.0 | 13.9  | 20.9 | 16.3  | 7.5  |
|         | 75         |           | 13.9      | 14.3 | 15.9 | 14.9  | 21.3 | 17.2  | 7.8  |
|         | 100        |           | 15.2      | 15.4 | 16.6 | 15.5  | 22.1 | 17.9  | 8.1  |
|         | 75         | Yes       | 13.5      | 14.3 | 16.1 | 14.3  | 20.6 | 16.6  | 8.0  |
|         | 100        | Yes       | 14.1      | 14.0 | 15.2 | 14.3  | 19.6 | 16.3  | 6.8  |

# APPENDIX E

TABLE E-1. - Fuel economy, mpg - baseline vehicles (1970 MY) --Continued

| Car No. | Temp., ° F | Air cond. | Urban FTP |      |      | Urban | HFET | 55/45 |     | NYCC |
|---------|------------|-----------|-----------|------|------|-------|------|-------|-----|------|
|         |            |           | CT        | ST   | HT   |       |      | Comp. |     |      |
| 6       | 25         |           | 7.3       | 9.7  | 11.7 | 9.5   | 17.0 | 11.9  | 5.3 |      |
|         | 50         |           | 10.2      | 10.6 | 12.3 | 11.0  | 18.4 | 13.4  | 5.7 |      |
|         | 75         |           | 11.3      | 10.9 | 13.0 | 11.5  | 19.2 | 14.0  | 5.9 |      |
|         | 100        |           | 11.5      | 11.2 | 13.4 | 11.8  | 19.7 | 14.4  | 5.7 |      |
|         | 75         | Yes       | 10.5      | 10.1 | 11.9 | 10.6  | 17.3 | 12.8  | 5.2 |      |
|         | 100        | Yes       | 10.9      | 10.3 | 11.8 | 10.8  | 16.5 | 12.8  | 5.3 |      |
| 7       | 25         |           | 11.8      | 13.6 | 16.0 | 13.8  | 21.7 | 16.5  | 6.8 |      |
|         | 50         |           | 12.8      | 12.8 | 16.0 | 13.3  | 21.3 | 16.0  | 7.2 |      |
|         | 75         |           | 14.0      | 13.8 | 15.8 | 14.3  | 22.5 | 17.1  | 7.5 |      |
|         | 100        |           | 15.1      | 14.4 | 16.8 | 14.9  | 21.7 | 17.4  | 7.2 |      |
|         |            |           |           |      |      |       |      |       |     |      |
| 8       | 25         |           | 9.0       | 10.5 | 12.2 | 10.5  | 17.3 | 12.8  | 6.1 |      |
|         | 50         |           | 10.7      | 11.5 | 14.0 | 11.9  | 18.5 | 14.2  | 6.8 |      |
|         | 75         |           | 11.5      | 11.5 | 14.3 | 12.2  | 17.9 | 14.2  | 6.9 |      |
|         | 100        |           | 12.6      | 12.1 | 14.5 | 12.8  | 18.4 | 14.8  | 6.6 |      |
|         | 75         | Yes       | 10.9      | 10.9 | 12.9 | 11.4  | 16.5 | 13.2  | 6.3 |      |
|         | 100        | Yes       | 12.1      | 11.1 | 13.3 | 11.9  | 16.7 | 13.6  | 6.3 |      |
| 9       | 25         |           | 10.0      | 12.2 | 14.2 | 12.4  | 18.3 | 14.7  | 6.7 |      |
|         | 50         |           | 10.9      | 12.7 | 14.0 | 12.6  | 19.9 | 15.0  | 7.1 |      |
|         | 75         |           | 12.2      | 13.1 | 14.7 | 13.2  | 20.1 | 15.6  | 7.4 |      |
|         | 100        |           | 13.5      | 13.5 | 15.6 | 13.8  | 20.0 | 16.1  | 7.1 |      |
|         | 75         | Yes       | 12.8      | 12.2 | 14.6 | 12.9  | 18.0 | 14.3  | 6.8 |      |
|         | 100        | Yes       | 12.1      | 12.5 | 14.0 | 12.8  | 19.0 | 15.0  | 7.1 |      |
| 10      | 25         |           | 9.4       | 12.9 | 15.4 | 12.5  | 20.6 | 15.2  | 7.5 |      |
|         | 50         |           | 11.7      | 13.3 | 16.3 | 13.9  | 20.9 | 16.3  | 8.7 |      |
|         | 75         |           | 13.9      | 14.1 | 15.9 | 14.5  | 22.4 | 17.2  | 7.1 |      |
|         | 100        |           | 15.3      | 14.5 | 17.3 | 15.3  | 21.7 | 17.7  | 7.0 |      |
|         |            |           |           |      |      |       |      |       |     |      |

# APPENDIX E

TABLE E-1. - Fuel economy, mpg - baseline vehicles (1970 MY) --Continued

| Car No. | Temp., ° F | Air cond. | Urban FTP |      |      |       | Urban | HFET | 55/45 |  | NYCC |
|---------|------------|-----------|-----------|------|------|-------|-------|------|-------|--|------|
|         |            |           | CT        | ST   | HT   | Comp. |       |      |       |  |      |
| 11      | 25         |           | 9.3       | 13.6 | 15.9 | 13.0  | 21.2  | 15.7 | 7.6   |  |      |
|         | 50         |           | 10.5      | 13.6 | 15.0 | 13.0  | 21.7  | 15.9 | 8.1   |  |      |
|         | 75         |           | 12.5      | 15.8 | 17.9 | 15.2  | 23.5  | 18.1 | 8.5   |  |      |
|         | 100        |           | 13.8      | 15.8 | 18.0 | 15.6  | 23.9  | 18.5 | 8.7   |  |      |
| 12      | 25         |           | 7.8       | 10.4 | 11.4 | 10.0  | 17.5  | 12.4 | 5.9   |  |      |
|         | 50         |           | 11.0      | 12.3 | 14.4 | 12.5  | 18.5  | 14.6 | 6.5   |  |      |
|         | 75         |           | 12.7      | 12.8 | 14.6 | 13.2  | 20.8  | 15.8 | 6.2   |  |      |
|         | 100        |           | 12.8      | 12.7 | 14.9 | 13.2  | 20.0  | 15.6 | 6.5   |  |      |
| 13      | 25         | Yes       | 10.8      | 11.0 | 13.2 | 11.4  | 17.6  | 13.6 | 6.4   |  |      |
|         | 50         | Yes       | 10.4      | 10.5 | 11.9 | 10.9  | 15.9  | 12.7 | 5.8   |  |      |
|         | 75         |           | 9.9       | 12.8 | 14.8 | 12.5  | 20.9  | 15.2 | 7.0   |  |      |
|         | 100        |           | 12.0      | 14.2 | 15.5 | 14.0  | 20.7  | 16.4 | 7.0   |  |      |
| 14      | 25         |           | 13.5      | 14.5 | 16.4 | 14.7  | 22.0  | 17.3 | 7.7   |  |      |
|         | 50         |           | 14.3      | 14.9 | 16.6 | 15.2  | 20.4  | 17.2 | 8.2   |  |      |
|         | 75         | Yes       | 12.0      | 12.9 | 17.9 | 13.8  | 19.2  | 15.8 | 7.4   |  |      |
|         | 100        | Yes       | 12.5      | 12.1 | 13.6 | 12.6  | 18.4  | 14.7 | 5.5   |  |      |
| 15      | 25         |           | 12.3      | 16.4 | 18.4 | 16.1  | 24.9  | 19.2 | 9.5   |  |      |
|         | 50         |           | 13.5      | 17.5 | 20.8 | 17.0  | 26.3  | 20.3 | 9.7   |  |      |
|         | 75         |           | 17.3      | 18.6 | 21.3 | 18.7  | 27.4  | 21.3 | 9.0   |  |      |
|         | 100        |           | 18.3      | 19.3 | 21.6 | 19.4  | 23.1  | 22.5 | 9.9   |  |      |
|         | 25         |           | 12.8      | 16.0 | 17.4 | 15.5  | 22.0  | 17.3 | 8.9   |  |      |
|         | 50         |           | 15.4      | 17.2 | 20.1 | 17.5  | 24.3  | 20.0 | 9.4   |  |      |
|         | 75         |           | 17.3      | 13.6 | 20.0 | 13.6  | 25.2  | 21.1 | 10.3  |  |      |
|         | 100        |           | 18.7      | 19.5 | 21.6 | 19.8  | 26.5  | 22.4 | 10.5  |  |      |
|         | 75         | Yes       | 16.5      | 17.8 | 19.4 | 17.9  | 25.3  | 20.6 | 9.9   |  |      |
|         | 100        | Yes       | 17.0      | 17.7 | 13.9 | 17.3  | 23.8  | 20.1 | 9.8   |  |      |

# APPENDIX E

TABLE E-1. - Fuel economy, mpg - baseline vehicles (1970 MY)--Continued

| 55/45   |            |           |                 |      |                 |                  |       |      |  |
|---------|------------|-----------|-----------------|------|-----------------|------------------|-------|------|--|
| Car No. | Temp., ° F | Air cond. | Urban FTP       |      |                 | HFE <sup>1</sup> | Comp. | NYCC |  |
|         |            |           | CT <sup>2</sup> | ST   | HT <sup>3</sup> |                  |       |      |  |
| 16      | 25         |           | 9.6             | 11.7 | 13.7            | 13.8             | 14.1  | 6.4  |  |
|         | 50         |           | 10.5            | 12.2 | 13.7            | 19.3             | 14.6  | 6.9  |  |
|         | 75         |           | 12.0            | 13.0 | 14.9            | 19.8             | 15.6  | 6.8  |  |
|         | 100        |           | 13.4            | 13.1 | 14.9            | 20.3             | 16.0  | 7.1  |  |
|         | 75         | Yes       | 11.5            | 12.2 | 13.9            | 19.4             | 14.8  | 6.5  |  |
| 17      | 100        | Yes       | 11.8            | 11.6 | 13.5            | 13.0             | 14.2  | 6.2  |  |
|         | 25         |           | 9.0             | 11.4 | 13.4            | 18.6             | 13.7  | 6.3  |  |
|         | 50         |           | 10.6            | 12.7 | 14.2            | 19.6             | 15.0  | 6.5  |  |
|         | 75         |           | 12.2            | 12.8 | 14.7            | 19.7             | 15.5  | 6.8  |  |
|         | 100        |           | 13.5            | 12.9 | 14.3            | 20.1             | 15.9  | 6.8  |  |
| 18      | 25         |           | 10.1            | 10.8 | 14.1            | 19.7             | 14.3  | 6.2  |  |
|         | 50         |           | 13.0            | 13.4 | 16.6            | 21.0             | 16.5  | 6.5  |  |
|         | 75         |           | 13.7            | 13.5 | 16.3            | 21.5             | 16.6  | 6.7  |  |
|         | 100        |           | 14.9            | 14.0 | 16.3            | 22.0             | 17.2  | 6.6  |  |
| 19      | 25         |           | 7.9             | 9.6  | 11.6            | 16.0             | 11.7  | 5.3  |  |
|         | 50         |           | 9.4             | 10.3 | 11.8            | 16.7             | 12.6  | 5.2  |  |
|         | 75         |           | 10.0            | 10.4 | 12.7            | 17.3             | 13.0  | 5.7  |  |
|         | 100        |           | 11.0            | 10.8 | 12.9            | 17.9             | 13.5  | 5.8  |  |
| 20      | 25         |           | 8.5             | 10.5 | 11.9            | 17.4             | 12.6  | 5.6  |  |
|         | 50         |           | 10.0            | 10.8 | 11.7            | 18.3             | 13.3  | 5.7  |  |
|         | 75         |           | 11.4            | 11.4 | 12.8            | 13.1             | 13.9  | 5.6  |  |
|         | 100        |           | 12.3            | 12.0 | 13.5            | 19.4             | 14.9  | 5.3  |  |
|         | 75         | Yes       | 10.7            | 10.9 | 12.3            | 17.3             | 13.3  | 5.9  |  |
|         | 100        | Yes       | 11.2            | 11.2 | 12.4            | 17.2             | 13.5  | 5.5  |  |

# APPENDIX E

TABLE E-1. - Fuel economy, mpg - baseline vehicles (1970 MY)--Continued

| Car No. | Temp., ° F | Air cond. | Urban FTP |      |      | Urban | 55/45 |       | NYCC |
|---------|------------|-----------|-----------|------|------|-------|-------|-------|------|
|         |            |           | CT        | ST   | HT   |       | HFET  | Comp. |      |
| 21      | 25         |           | 14.9      | 16.4 | 21.1 | 17.1  | 23.5  | 20.9  | 9.0  |
|         | 50         |           | 17.2      | 19.7 | 23.2 | 19.9  | 28.5  | 23.0  | 10.6 |
|         | 75         |           | 20.6      | 19.6 | 23.5 | 20.8  | 33.9  | 24.4  | 10.8 |
|         | 100        |           | 22.1      | 21.6 | 25.1 | 22.6  | 33.3  | 26.6  | 11.2 |
| 22      | 25         |           | 13.2      | 16.6 | 18.2 | 16.1  | 24.0  | 18.9  | 9.5  |
|         | 50         |           | 15.7      | 17.1 | 20.9 | 17.7  | 25.0  | 20.4  | 10.6 |
|         | 75         |           | 18.9      | 18.9 | 20.1 | 19.2  | 25.6  | 21.7  | 9.9  |
|         | 100        |           | 20.3      | 19.7 | 21.3 | 20.2  | 26.3  | 22.6  | 10.5 |
| 23      | 25         |           | 7.6       | 9.3  | 11.1 | 9.3   | 14.8  | 11.2  | 5.2  |
|         | 50         |           | 9.0       | 10.0 | 12.0 | 10.2  | 15.5  | 12.1  | 5.3  |
|         | 75         |           | 9.7       | 9.3  | 11.1 | 10.1  | 15.1  | 11.9  | 4.6  |
|         | 100        |           | 10.5      | 10.3 | 11.8 | 10.7  | 16.1  | 12.6  | 5.3  |
| 24      | 25         | Yes       | 9.0       | 9.5  | 10.5 | 9.6   | 14.1  | 11.2  | 5.6  |
|         | 50         | Yes       | 9.5       | 9.5  | 10.3 | 9.7   | 14.2  | 11.3  | 5.3  |
|         | 75         |           | 17.5      | 22.1 | 23.9 | 21.4  | 32.2  | 25.2  | 13.1 |
|         | 100        |           | 20.8      | 22.7 | 26.8 | 23.3  | 33.5  | 27.0  | 14.0 |
| 25      | 25         |           | 23.5      | 22.3 | 27.4 | 24.1  | 34.4  | 27.3  | 12.8 |
|         | 50         |           | 24.0      | 23.2 | 27.1 | 24.3  | 35.1  | 23.2  | 12.9 |
|         | 75         |           | 10.7      | 13.3 | 16.6 | 13.4  | 23.8  | 16.6  | 7.7  |
|         | 100        |           | 12.3      | 13.9 | 18.2 | 14.4  | 25.3  | 17.9  | 8.2  |
|         | 25         |           | 14.3      | 15.4 | 18.3 | 15.3  | 25.8  | 19.1  | 8.3  |
|         | 75         |           | 15.0      | 15.5 | 19.2 | 16.5  | 26.1  | 19.8  | 8.4  |

# APPENDIX E

TABLE E-1. - Fuel economy, mpg - baseline vehicles (1970 MY)--Continued

| Car No. | Temp., ° F | Air cond. | Urban FPP |      |      | Urban | 55/45 |       | NYCC |
|---------|------------|-----------|-----------|------|------|-------|-------|-------|------|
|         |            |           | CT        | ST   | HT   |       | HFET  | Comp. |      |
| 26      | 25         |           | 8.6       | 11.4 | 12.7 | 11.0  | 18.7  | 13.5  | 6.0  |
|         | 50         |           | 10.6      | 12.4 | 14.8 | 12.5  | 20.0  | 15.1  | 6.6  |
|         | 75         |           | 11.5      | 11.9 | 13.9 | 12.3  | 19.3  | 14.7  | 6.8  |
|         | 100        |           | 13.8      | 13.5 | 15.1 | 14.0  | 20.0  | 16.1  | 6.8  |
|         | 75         | Yes       | 11.3      | 11.6 | 13.9 | 12.1  | 19.1  | 14.5  | 6.5  |
| 27      | 100        | Yes       | 12.3      | 11.7 | 13.6 | 12.3  | 17.8  | 14.3  | 6.2  |
|         | 25         |           | 8.0       | 11.5 | 13.1 | 10.9  | 18.8  | 13.4  | 6.6  |
|         | 50         |           | 11.0      | 12.7 | 14.9 | 12.8  | 19.7  | 15.2  | 6.2  |
|         | 75         |           | 12.1      | 12.6 | 15.1 | 13.0  | 20.6  | 15.6  | 7.0  |
|         | 100        |           | 13.2      | 13.2 | 14.8 | 13.6  | 21.0  | 16.2  | 6.8  |
| 28      | 75         | Yes       | 11.8      | 12.2 | 14.2 | 12.6  | 19.7  | 15.0  | 6.8  |
|         | 100        | Yes       | 12.3      | 12.3 | 14.2 | 12.8  | 18.9  | 15.0  | 5.3  |
|         | 25         |           | 10.2      | 16.1 | 17.3 | 14.7  | 21.8  | 17.2  | 9.8  |
|         | 50         |           | 12.0      | 17.9 | 20.3 | 16.7  | 25.8  | 19.3  | 11.5 |
|         | 75         |           | 14.7      | 19.3 | 21.8 | 18.7  | 25.5  | 21.2  | 11.6 |
| 29      | 100        |           | 17.8      | 19.8 | 21.3 | 19.7  | 26.5  | 22.3  | 11.2 |
|         | 25         |           | 15.2      | 19.2 | 22.0 | 19.2  | 32.6  | 23.6  | 12.0 |
|         | 50         |           | 20.8      | 23.5 | 26.3 | 23.5  | 35.8  | 23.1  | 12.8 |
|         | 75         |           | 21.9      | 24.7 | 26.3 | 24.5  | 36.3  | 23.3  | 12.1 |
|         | 100        |           | 21.7      | 20.7 | 25.6 | 22.1  | 36.7  | 26.9  | 12.5 |
| 30      | 25         |           | 7.3       | 3.9  | 10.9 | 9.0   | 16.4  | 11.3  | 4.9  |
|         | 50         |           | 3.7       | 9.5  | 11.8 | 9.9   | 16.9  | 12.1  | 5.1  |
|         | 75         |           | 9.9       | 9.6  | 12.1 | 10.3  | 17.7  | 12.5  | 5.1  |
|         | 100        |           | 10.3      | 9.7  | 12.0 | 10.5  | 17.1  | 12.7  | 4.9  |
|         | 75         | Yes       | 9.2       | 9.5  | 11.3 | 9.8   | 15.3  | 12.0  | 4.7  |
| 30      | 100        | Yes       | 10.2      | 9.2  | 11.3 | 9.9   | 15.9  | 11.9  | 4.7  |

# APPENDIX E

TABLE E-2. - Fuel economy, mpg - production late model

| TABLE E-2. |            |           |           |      |      |       |       |       |      |
|------------|------------|-----------|-----------|------|------|-------|-------|-------|------|
| Car No.    | Temp., ° F | Air cond. | Urban FTP |      |      | Urban | 55/45 |       | NYCC |
|            |            |           | CT        | ST   | HT   |       | HFET  | Comp. |      |
| 1          | 25         |           | 12.2      | 15.5 | 16.6 | 14.9  | 22.1  | 17.4  | 9.1  |
|            | 50         |           | 13.9      | 16.1 | 17.2 | 15.9  | 22.6  | 13.3  | 9.4  |
|            | 75         |           | 14.5      | 16.0 | 17.1 | 15.9  | 22.9  | 13.4  | 9.1  |
|            | 100        |           | 16.2      | 17.7 | 19.6 | 17.3  | 24.4  | 20.3  | 9.9  |
|            | 75         | Yes       | 14.4      | 11.9 | 13.5 | 15.2  | 21.9  | 17.6  | 7.3  |
|            | 100        | Yes       | 15.0      | 14.7 | 16.2 | 15.2  | 21.1  | 17.3  | 7.3  |
| 2          | 25         |           | 10.3      | 17.1 | 17.1 | 15.0  | 22.6  | 17.7  | 10.9 |
|            | 50         |           | 12.6      | 17.5 | 18.1 | 16.3  | 24.1  | 13.1  | 9.5  |
|            | 75         |           | 15.9      | 19.3 | 17.9 | 17.6  | 25.8  | 20.5  | 9.6  |
|            | 100        |           | 17.2      | 19.5 | 20.2 | 19.2  | 25.5  | 21.6  | 10.0 |
|            | 75         | Yes       | 15.0      | 16.7 | 18.4 | 16.8  | 24.0  | 19.4  | 9.4  |
|            | 100        | Yes       | 15.9      | 17.2 | 18.1 | 17.1  | 22.8  | 19.3  | 9.3  |
| 3          | 25         |           | 11.9      | 13.4 | 16.2 | 13.7  | 24.4  | 17.1  | 8.7  |
|            | 50         |           | 12.9      | 14.2 | 17.2 | 14.6  | 24.8  | 17.9  | 8.3  |
|            | 75         |           | 14.7      | 15.0 | 17.6 | 15.6  | 24.7  | 13.7  | 8.7  |
|            | 100        |           | 16.2      | 15.1 | 18.0 | 16.0  | 26.1  | 19.4  | 3.6  |
|            | 75         | Yes       | 12.5      | 13.1 | 14.8 | 13.4  | 21.4  | 16.1  | 7.9  |
|            | 100        | Yes       | 15.4      | 14.1 | 16.5 | 14.9  | 24.3  | 18.1  | 3.0  |
| 4          | 25         |           | 17.0      | 21.6 | 23.4 | 20.9  | 30.6  | 24.4  | 14.8 |
|            | 50         |           | 19.5      | 23.4 | 23.7 | 22.5  | 30.7  | 25.6  | 15.9 |
|            | 75         |           | 22.7      | 24.0 | 25.4 | 24.3  | 32.8  | 27.5  | 15.8 |
|            | 100        |           | 23.5      | 24.0 | 25.7 | 24.3  | 33.1  | 27.6  | 14.2 |
|            | 75         | Yes       | 22.3      | 23.6 | 24.4 | 23.5  | 32.0  | 25.7  | 15.2 |
|            | 100        | Yes       | 21.4      | 20.7 | 23.0 | 21.4  | 31.5  | 25.0  | 12.1 |

# APPENDIX E

TABLE E-2. - Fuel economy, mpg - production late model--Continued

| Car No. | Temp., ° F | Air cond. | Urban FTP |      |      |       | 55/45 |       | NYCC |
|---------|------------|-----------|-----------|------|------|-------|-------|-------|------|
|         |            |           | CT        | ST   | HT   | Urban | HFET  | Comp. |      |
| 5       | 25         |           | 14.7      | 13.4 | 20.6 | 18.0  | 27.7  | 21.4  | 9.6  |
|         | 50         |           | 16.3      | 18.3 | 20.3 | 13.4  | 27.9  | 21.7  | 10.2 |
|         | 75         |           | 17.4      | 18.5 | 20.6 | 18.8  | 23.8  | 22.3  | 11.0 |
|         | 100        |           | 19.8      | 21.2 | 22.6 | 21.2  | 29.8  | 24.4  | 11.0 |
|         | 75         | Yes       | 16.5      | 17.7 | 19.1 | 17.8  | 27.7  | 21.2  | 9.1  |
| 6       | 100        | Yes       | 15.6      | 16.3 | 8.2  | 16.6  | 24.7  | 19.5  | 8.1  |
|         | 25         |           | 12.0      | 13.0 | 16.0 | 13.5  | 23.9  | 16.8  | 7.0  |
|         | 50         |           | 14.5      | 16.3 | 19.3 | 16.6  | 25.2  | 19.6  | 8.0  |
|         | 75         |           | 16.4      | 15.9 | 20.1 | 17.0  | 26.3  | 20.2  | 9.7  |
|         | 100        |           | 17.7      | 16.5 | 20.7 | 17.7  | 27.2  | 21.0  | 8.5  |
| 7       | 75         | Yes       | 15.3      | 15.2 | 18.0 | 15.9  | 25.2  | 19.1  | 7.9  |
|         | 100        | Yes       | 15.1      | 14.2 | 17.3 | 15.1  | 23.6  | 13.0  | 7.1  |
|         | 25         |           | 27.1      | 26.9 | 33.9 | 32.3  | 39.8  | 35.3  | 22.6 |
|         | 50         |           | 31.6      | 36.4 | 37.1 | 35.4  | 43.6  | 38.7  | 24.5 |
|         | 75         |           | 32.1      | 37.3 | 36.4 | 35.9  | 41.9  | 38.4  | 20.5 |
|         | 100        |           | 35.0      | 39.0 | 38.2 | 37.9  | 42.4  | 39.8  | 24.0 |
|         | 75         | Yes       | 29.9      | 32.5 | 34.0 | 32.3  | 40.8  | 35.6  | 19.8 |
|         | 100        | Yes       | 26.7      | 27.1 | 28.4 | 27.4  | 36.0  | 30.7  | 17.6 |

APPENDIX F. - ALDEHYDES, MGPM - PRODUCTION LATE MODEL

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# APPENDIX F

TABLE F-1. - Aldehydes, mgpm - production late model

| Car No. | Temp., ° F | Air cond. | Urban FTP |      |      |       |
|---------|------------|-----------|-----------|------|------|-------|
|         |            |           | CT        | ST   | HT   | Urban |
| 1       | 25         |           | 36.6      | 0.0  | 0.0  | 7.6   |
|         | 50         |           | 36.4      | 10.4 | 5.6  | 14.4  |
|         | 75         |           | 22.4      | 0.0  | 2.8  | 5.4   |
|         | 100        |           | 29.8      | 4.0  | 2.8  | 9.0   |
|         | 75         | Yes       | 25.1      | 2.6  | 2.8  | 7.3   |
| 2       | 100        | Yes       | 22.5      | 0.0  | 3.6  | 5.7   |
|         | 25         |           | 41.4      | 0.0  | 0.0  | 8.6   |
|         | 50         |           | 33.4      | 0.0  | 0.0  | 6.9   |
|         | 75         |           | 24.6      | 0.0  | 0.0  | 5.1   |
|         | 100        |           | 31.2      | 4.6  | 4.9  | 10.2  |
| 3       | 75         | Yes       | 34.2      | 10.8 | 4.1  | 13.8  |
|         | 100        | Yes       | 26.3      | 3.0  | 5.5  | 8.5   |
|         | 25         |           | 90.2      | 29.4 | 23.4 | 43.3  |
|         | 50         |           | 66.6      | 19.7 | 22.5 | 30.2  |
|         | 75         |           | 31.4      | 7.9  | 17.9 | 15.5  |
| 4       | 100        |           | 36.8      | 1.6  | 7.3  | 10.4  |
|         | 75         | Yes       | 18.8      | 0.0  | 0.0  | 3.9   |
|         | 100        | Yes       | 54.5      | 4.3  | 5.6  | 14.9  |
|         | 25         |           | 37.7      | 19.3 | 16.2 | 22.2  |
|         | 50         |           | 16.4      | 14.3 | 4.5  | 11.9  |
|         | 75         |           | 30.8      | 23.1 | 23.1 | 27.3  |
|         | 100        |           | 17.6      | 14.1 | 14.9 | 15.0  |
|         | 75         | Yes       | 34.6      | 36.4 | 30.9 | 34.5  |
|         | 100        | Yes       | 12.3      | 4.3  | 8.3  | 7.0   |

# APPENDIX F

TABLE F-1. - Aldehydes, mgpm - production late model--Continued

| Car<br>No | Temp.,<br>° F | Air<br>cond. | Urban FTP |      |      |       |
|-----------|---------------|--------------|-----------|------|------|-------|
|           |               |              | CT        | ST   | HT   | Urban |
| 5         | 25            |              | 29.1      | 23.2 | 18.1 | 23.0  |
|           | 50            |              | 27.9      | 25.3 | 16.7 | 23.8  |
|           | 75            |              | 25.4      | 23.1 | 22.4 | 26.0  |
|           | 100           |              | 33.9      | 33.2 | 28.5 | 34.6  |
|           | 75            | Yes          | 34.8      | 34.8 | 31.7 | 33.9  |
| 6         | 100           | Yes          | 25.4      | 31.1 | 25.9 | 28.5  |
|           | 25            |              | 20.0      | 4.2  | 2.9  | 7.2   |
|           | 50            |              | 13.3      | 2.6  | 2.2  | 4.7   |
|           | 75            |              | 9.2       | 0.0  | 0.0  | 1.9   |
|           | 100           |              | 14.1      | 0.0  | 0.0  | 2.6   |
| 7         | 75            | Yes          | 16.4      | 0.0  | 0.0  | 3.3   |
|           | 100           | Yes          | 29.5      | 9.6  | 5.0  | 12.4  |
|           | 25            |              | 0.0       | 0.0  | 0.0  | 0.0   |
|           | 50            |              | 0.0       | 0.0  | 0.0  | 0.0   |
|           | 75            |              | 35.3      | 33.5 | 32.7 | 33.7  |
|           | 100           |              | 0.0       | 0.0  | 0.0  | 0.0   |

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